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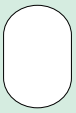

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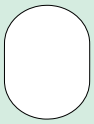

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Better Beekeeping

The Ultimate Guide to Keeping Stronger Colonies and Healthier, More Productive Bees

ISBN: 9781592536528

This book builds upon an established knowledge of beekeeping with real-world study, smart, intuitive thinking, and setting of goals to achieve a balance of biology and business.

The Backyard Beekeeper - Revised and Updated, 3rd Edition

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The Backyard Beekeeper's Honey Handbook

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ISBN: 9780785829171

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Also Available

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Create Vertical Gardens with Purpose: Pollinators - Herbs and Veggies - Aromatherapy - Many More

By Shawna Coronado

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ISBN: 9780760347386

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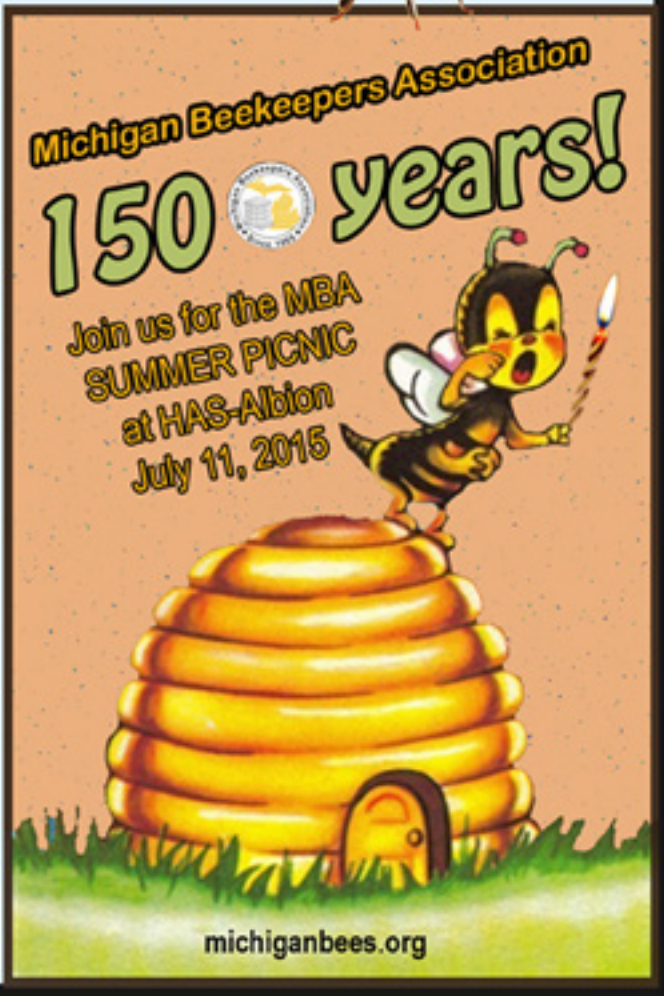

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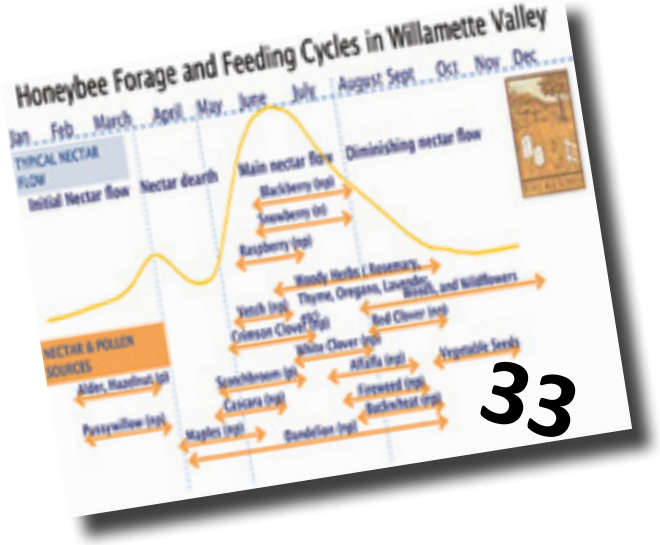

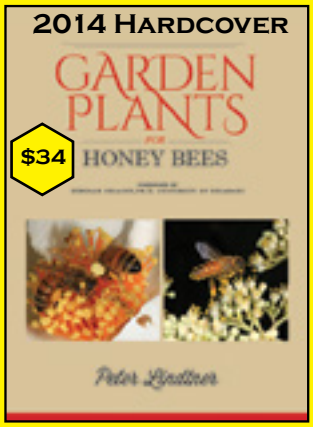

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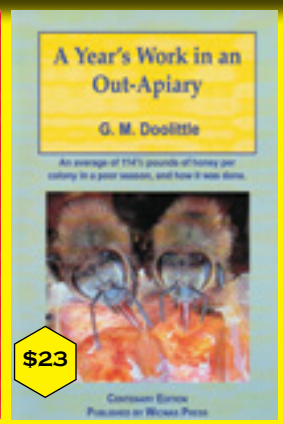

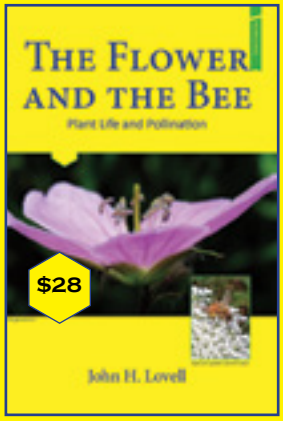

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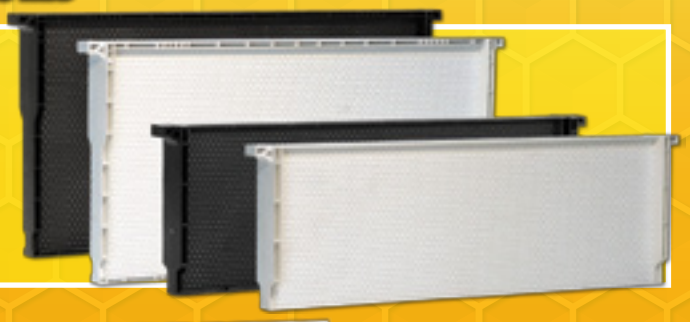

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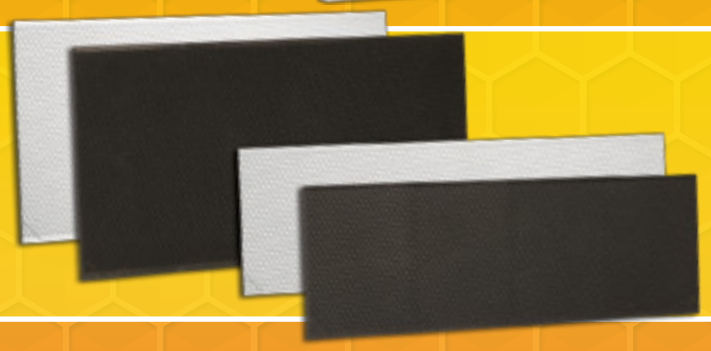

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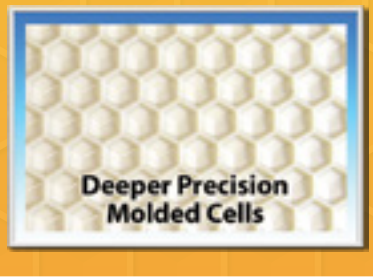

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Deeps, Not Packages!

Packages and nucs are tauntingly small. With problematic survival rates, building up a nuc or a package to survive the Winter leaves little honey for the beginner in the first year. For four years I have sold deeps filled with bees to beginners after apple pollination. They always get honey their first year. Some take off all of the honey in the fall and start with a new deep the following Spring. A deep is easier for a beginner to work with. For beginners, it is well worth the extra few dollars to start with a deep. Let's be smart about helping new beekeepers get started. Sell them a deep instead of a nuc or package. I might argue that sending deeps North in the Spring may be a more effective way than a skimpy package or nuc. Plus it helps you get rid of older equipment.

Rick Green

Cornflowers, Etc.

Let me begin by introducing myself, I am Jesse Scott and I am from the very southeast corner of Montana, where I am the noxious weed coordinator for Carter County.

My job entails that noxious weeds are managed and the spreading of those weeds are controlled and prevented if possible. Most noxious weeds are introduced (non-native) species, and have been introduced into our ecosystems by ignorance, mismanagement, or accident.

Typically they are plants that grow aggressively, multiply quickly without natural controls, and adversely affect native habitats, croplands, and/or may be injurious to humans or livestock through contact or ingestion. Noxious weed infestations degrade native plant communities, which provide valuable food and shelter for wildlife and contribute to a loss of agriculture productivity. They also greatly disrupt the recreational enjoyment of our natural resources and have serious economical impacts associated with their management. Left unchecked, noxious weeds will limit many uses on the land now and for future generations.

So by this point you may be wondering why I am blabbering on about noxious weeds, I was reading an article in the May 2015 issue of *Bee Culture* titled "Cornflowers, Star Thistle and Related Bee Plants" by Connie Krochmal and this is the only email address I could find on the *Bee Culture* website. In Connie's article she mentions many plants, but she also mentions noxious weeds and is promoting the spread by planting of these species.

Russian Knapweed (*Centaurea repens*) mentioned on page 55, is listed as a noxious weed in the following 18 states: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Iowa, Kansas, Montana, Nevada, New Mexico, North Dakota, Oregon, South Carolina, South Dakota, Utah, Washington, and Wyoming (this information can be found here at in the **USDA Plants Database**).

Russian knapweed is not considered naturalized in any of the states in the West, Midwest or Central regions as stated in the article and is also toxic to horses causing chewing disease, which causes the horse to be able to chew

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but not able to swallow by affecting the brain and causing a softening of the tissues.

One other plant that caught my attention was also on page 55 Yellow Star Thistle (*Centaurea solstitialis*) which is also noxious in the following 11 states: Arizona, California, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, and Washington. Yellow Star Thistle, like Russian Knapweed is not considered naturalized and also causes chewing disease in horses. Although they were not mentioned by name other knapweed species such as Spotted Knapweed and Diffuse Knapweed are also noxious weeds were recommended on page 53 under the heading of Recommended Species for Bees.

Overall I felt this article was poorly researched and the writer is basically telling people to break laws. In many states including Montana there are laws that state it is illegal to grow or propagate noxious weed species (in Montana

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this is found in Montana Code Annotated Title 7, Chapter 22, Part 21), also in many states as you cross state lines there are signs informing those who enter that the transport of invasive species is illegal. I believe the writer should have been focusing on finding suitable native plant species to enhance the environment for honey production rather than listing a bunch of non-native species that potentially have the ability or already have been found to harm the environment.

Jesse Scott
MT

Editor's Note: I appreciate your input here, but two things – first, Connie in no way promotes the use or propagation of these plants. Many she has reviewed over the years fall in the same category. **Review** the key word here. These plants exist in our universe, bees visit them and beekeepers want to know what they are. And second, what of those plants that are invasive that are beneficial – invasive or not, Yellow and white sweet clover to name two are extremely beneficial – yet are considered weeds and out of place in this country.

In a perfect world they would not be here. It is not a perfect world. They are here, and honey bees utilize them. And, of course, you are aware that honey bees are an invasive species also – not unlike you and I. I admire your efforts of rid us of those invasives that are harmful, but, like Purple Loosestrife and others, we will miss them when they are gone.

Wintering

I would like to comment on an article that ran in *Bee Culture* Sep. 2012 titled "Year Round Insulation," using insulation board on the outside of the hive. I am a small hobby beekeeper from the Catskill region of New York with anywhere from six to 10 hives at any given time. I thought that using insulated foam boards on the hives was a great idea because I always seemed to have some Winter loss but after the first Winter I tried this method I was not impressed. From the seven hives I had at the

beginning of Winter I had two left at the end of Winter. The bees had plenty of honey but apparently they starved. After wracking my brain for some time as to what caused the loss I came to the conclusion that the cause was what I call the "refrigerator effect." The hives were well insulated but as the Winter set in and the weather got colder and the temperature dropped on the inside and outside, I feel the insulation kept the cold inside like a well insulated refrigerator even when the temperature might have risen for a day or two on the outside with the sun shining.

At the start of the past Winter I had six hives and I went back to my old ways of wrapping with black roofing felt. One hive was a little short of honey so I added granular sugar under the top board on newspaper. I didn't think they would survive. This Winter was a little harsher then last Winter in our area but I didn't lose a single hive. They all seemed to Winter very well. I think I will stick to my old ways.

Henry Groth
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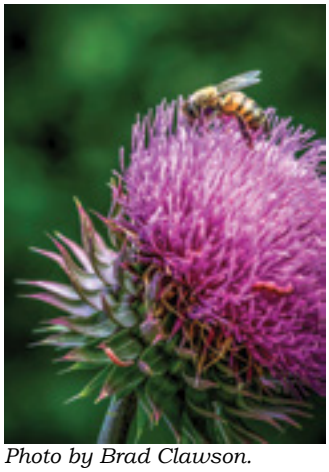

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Look What's New For You –

Bees. An Up-Close Look At Pollinators Around The World. Sam Droege and Laurence Packer. Published by Voyageur Press. ISBN 978-0-7603-4738-6. 8.5" x 11", landscape. Hard cover, 160 pgs. Color throughout. $25.

This isn't just about honey bees. It's about almost every bee you can imagine, and from all over the world – South America, Europe, Australia and the Pacific islands, Asia, North America (our common honey bee is found here), Africa and Central America and the Caribbean.

The over 300 photos are from pinned specimens that are in the public domain available from the US Geological Survey. They are, quite frankly, stunning. Which is why these two authors undertook this task. They wanted to share the beauty and diversity of bees from all over the world. There are approximately 20,000 named species of bees, with another 20,000, more or less, yet unnamed. There is much to do yet, but this is a good start.

With that, this book offers a rare sample of some of the most beautiful, and some of the most unique specimens. Each bee has usually two, sometimes more photos. An entire profile, and then a close up of the antenna or face, or maybe just a foot, excuse me, tarsus. Sometimes there are several photos highlighting several unique features of a particular insect.

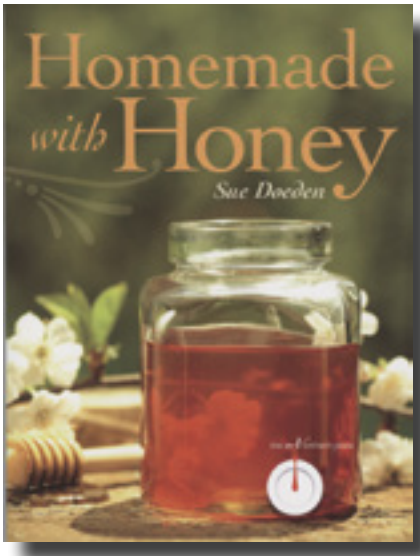
This is not a scientific text, nor is it meant to be. It offers short vignettes on each specimen, with just enough info to get you interested. And sometimes what they off is all that's known. It's to be picked up and looked at and picked up again. It's a bargain at the price. But it will steal more of your time than you realize. – *Kim Flottum*

Homemade with Honey. Sue Doeden. Published by Minnesota Historical Press. ISBN 978-0-87351-957-1. 145 pages. Black and white. 9" x 7". Soft cover. $17.95.

The author is a popular cooking instructor and food writer, and is the host of Good Food, Good Life 365 on Public TV. She knows her stuff, and it shows in the 75 recipes she offers here. But, still, I was ready to write this off as just another 'me-too' honey recipe book – there are a lot of them out there taking advantage of the popularity of our product right now, but a second look changed my mind. It didn't have fancy color photos, or popular TV stars in the kitchen, or wonderful photos of bees and flowers. It just has recipes. Imagine that.

I'm a pretty good cook, and I've put together several cooking with honey books over the years and I know what it takes to make good food better with honey instead of sugar. Each recipe comes with a bit of explanation on why it should be here, excellent instructions, and then tips for the cook. All in all making it easy to use, and, even for jaded writers like me, even fun to read.

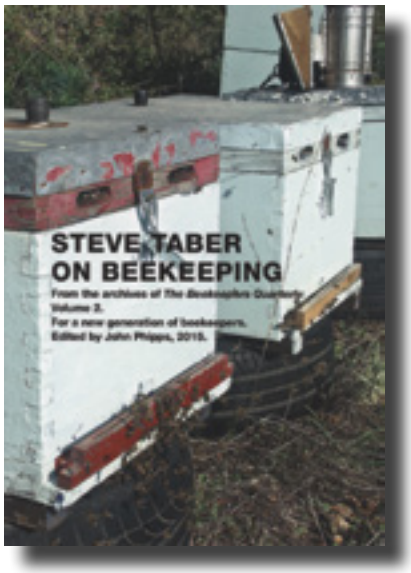
She covers starters and snacks, bread and breakfast, salads, soups, sides, and of course main dishes and sweets. None of these recipes are exotic or complicated, and, in my experience, all should be wonderful – that is, if you like honey in your home. – *Kim Flottum*



Steve Taber On Beekeeping. From the Archives of The Beekeepers Quarterly. Vol 2. Edited by John Phipps (the editor of *The Beekeepers Quarterly*). Published by Northern Bee Books. ISBN 978-1-908904-88-1. 6" x 9.5". Black and white, soft cover, 77 pgs. $20.

If you don't know who Steve Taber is, you should. He's gone now, but he was a USDA research scientist who helped a generation of scientists around today become better than they would have. When he retired he began raising queens, some of the best queen around, and he began writing for several journals. Ours, to be sure, and the Quarterly also. He wrote a book entitled *Breeding Super Bees* that we published and it's still one of the best queen production books around, standing the test of time.

He was outlandish, out spoken and outside the box most of the time. John adds that he was opinionated and provocative. And he was. He was unique in his research, and his demonstrations at meeting were remarkable. But he knew bees like no one I've known, before or since. When he said something it paid to listen, and when he wrote something it paid to read. This book in no exception. – *Kim Flottum*



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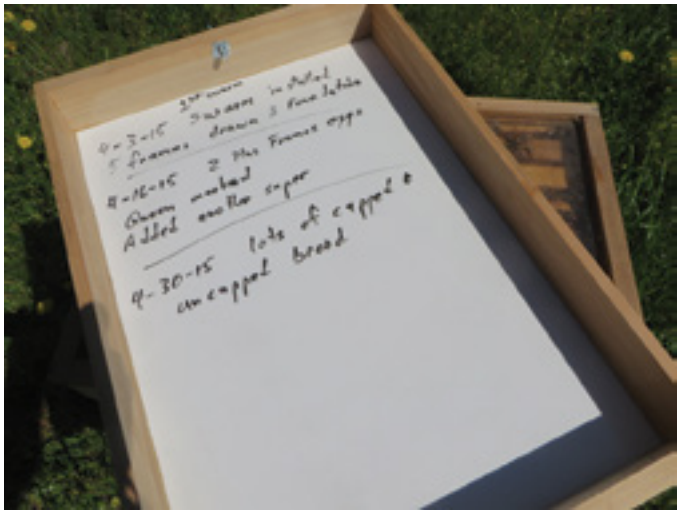

Millerbees Mfg. Locking Telescoping Cover, now with dry erase board inside. We looked at the locking cover a bit ago, making that old brick obsolete and keeping your covers on for good. Now, the cover has a dry erase board underneath to take and keep notes on. What a good idea! Visit **www.beetle-jail.com** for purchasing info.

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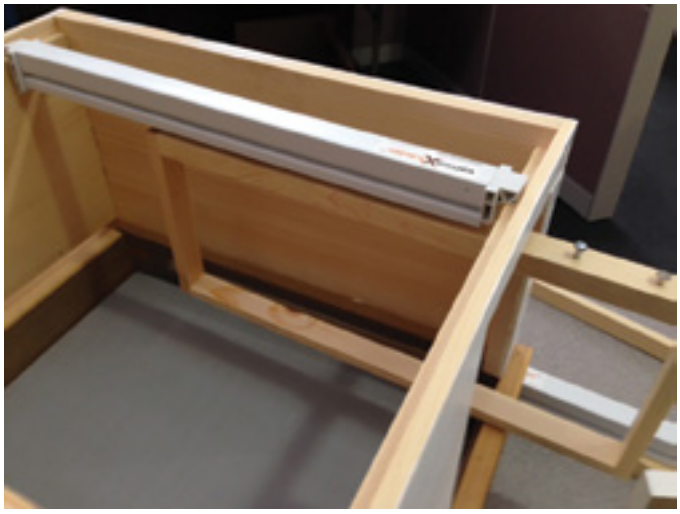

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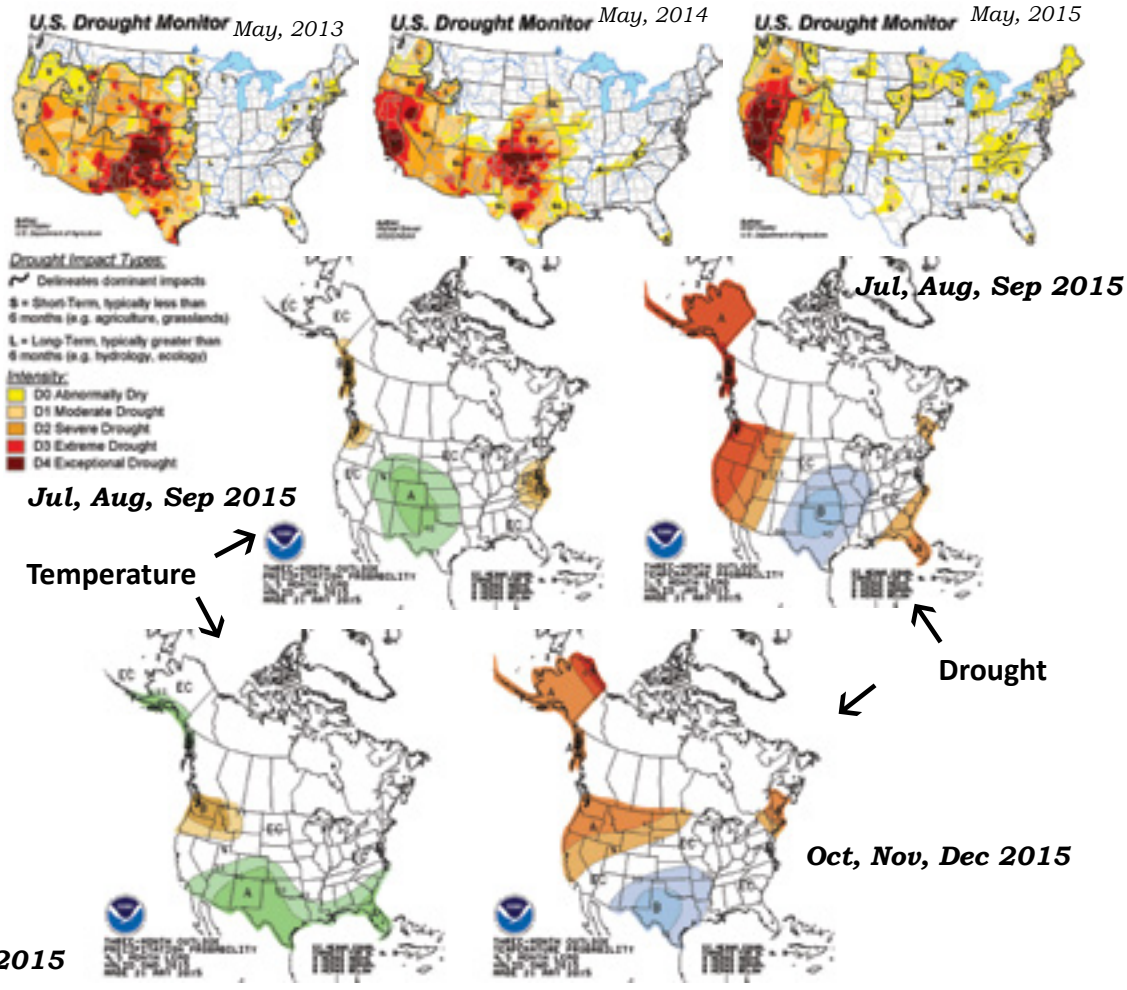
JULY – REGIONAL HONEY PRICE REPORT

Most years about now we take a look at the past, and the future – weather. Start with the Drought Monitor comparison for 2013, 2014 and 2015. In 2013 there were two dry areas, the central U.S. and most of the SW. Honey production in the driest areas in 2013 went like this in lbs. procuction/hive; TX – 59, OK – 39, NM – 39, CO – 43, and let's look at CA – 33. You can add NV – 39, AZ – 36, OR – 35, UT – 34, ID – 32 and WY – 66. For the same states in 2014, after it started to really dry out TX – 78, OK – 45, NM – 45, CO – 37, CA – 39, NV – 45, AZ – 39, OR – 40, UT – 28, ID – 45, and WY – 61. Hmmmm, not quite what you'd expect, right? Drier and more honey, on average. It will be interesting to see what 2015 brings for honey now that the central/west sections have been getting some moisture. The temperature maps show that not much is going to change, but it will get cooler in the SE over the next six months, and a bit warmer in the NE. Plus, the very SW is going to cool off just a tad. If you have bees and the next six month's weather is important, take a look – what's it going to be where you are, or are headed. Be Prepared.

U.S. Drought Monitor Weekly Comparison



	REPORTING REGIONS							SUMMARY			History	
	1	2	3	4	5	6	7	Range	Avg.	$/lb	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS												
55 Gal. Drum, Light	2.22	2.13	2.45	2.58	2.30	2.07	2.35	1.90-2.80	2.26	2.26	2.30	2.21
55 Gal. Drum, Ambr	1.90	2.05	2.23	2.50	2.19	1.94	2.30	1.80-2.70	2.13	2.13	2.19	2.05
60# Light (retail)	197.80	195.00	200.00	175.94	207.48	175.00	262.80	150.00-285.60	197.17	3.29	193.22	192.11
60# Amber (retail)	193.50	187.00	197.50	165.25	202.55	160.67	252.80	147.00-285.60	188.81	3.15	189.90	182.50
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	88.26	79.43	60.00	60.00	87.76	88.80	100.00	48.00-140.00	81.52	6.79	81.18	77.62
1# 24/case	118.60	101.55	119.33	103.50	106.43	82.50	134.80	45.00-156.00	112.35	4.68	114.47	111.87
2# 12/case	108.37	90.67	96.67	98.00	105.17	100.80	114.50	72.00-144.00	102.34	4.26	102.16	99.64
12.oz. Plas. 24/cs	87.12	80.50	92.00	90.91	94.05	109.20	111.80	72.00-120.00	92.09	5.12	93.91	86.82
5# 6/case	122.69	102.00	130.00	111.00	123.84	105.60	130.00	90.00-175.00	115.17	3.84	113.67	115.79
Quarts 12/case	169.81	121.65	126.00	139.45	148.27	151.20	145.00	110.00-202.80	140.14	3.89	136.69	133.58
Pints 12/case	96.15	82.75	80.00	87.00	93.09	73.20	104.00	60.00-138.00	87.18	4.84	87.86	83.85
RETAIL SHELF PRICES												
1/2#	4.47	4.21	3.50	3.16	3.51	4.25	6.00	2.90-6.00	4.14	8.28	4.22	4.06
12 oz. Plastic	5.02	4.94	5.13	4.38	5.44	5.15	8.00	3.39-8.99	5.24	6.98	5.18	4.88
1# Glass/Plastic	6.76	6.58	6.67	5.65	5.19	6.55	10.00	4.30-11.99	6.76	6.76	6.78	6.25
2# Glass/Plastic	12.18	10.72	11.25	11.63	11.28	13.16	16.00	8.99-18.00	12.12	6.06	11.35	10.74
Pint	10.48	8.67	8.33	9.67	9.50	8.83	14.00	4.87-21.00	9.52	6.34	9.63	8.57
Quart	19.04	15.44	14.67	16.56	18.50	14.25	22.00	11.25-30.00	16.65	5.55	15.42	14.76
5# Glass/Plastic	26.52	28.63	33.00	28.12	23.88	30.13	30.00	20.00-50.00	27.92	5.58	24.96	23.31
1# Cream	7.87	8.50	9.00	6.23	8.61	8.94	9.50	5.00-13.84	8.20	8.20	7.64	7.90
1# Cut Comb	9.72	9.75	7.67	9.05	11.48	8.75	17.00	6.00-20.00	9.96	9.96	9.40	8.90
Ross Round	10.09	7.00	8.00	8.60	8.28	9.13	8.28	6.00-10.50	8.31	11.08	8.23	8.64
Wholesale Wax (Lt)	6.70	4.50	6.38	7.50	7.31	4.00	5.00	3.00-13.99	6.13	-	5.62	5.45
Wholesale Wax (Dk)	6.17	4.09	6.00	6.63	6.10	3.50	4.75	2.85-10.50	5.53	-	4.84	4.60
Pollination Fee/Col.	96.25	61.00	100.00	66.67	98.69	93.00	117.50	45.00-185.00	82.38	-	74.10	82.73

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INNER COVER

I continue to be surprised by the connections and coincidences this page brings. And I remain humbled by the fact that I can offer my observations and thoughts that have at least, or mostly anyway, something to do with honey bees, beekeeping and the industry I'm a part of. For instance . . .

I began this column on Memorial Day. A remembering day of those who have given all for those of us who stayed behind for whatever reason. 50 years ago Vietnam would have been my trial by fire, but a Navy enlistment physical that came up short canceled any activity in that direction, so other life choices had to be made. Since then other clashes have come and gone and I have watched from the sidelines. So it goes.

Now, this piece comes to light right about on the 4th of July – the Holy day of Independence for all who live in this country. I've been privileged to travel to places other than here, and, all things considered, I'd rather be here. It ain't perfect, but it ain't bad. And not nearly as bad as a lot of places that make the 6:00 PM news every night. Not by a long shot.

So writing this on one Holy Day, and reading it on another is something of a privilege, don't you think? I tend not to dwell on patriotism and such, but I tend not to take it for granted, either. I am fortunate, as are you, that I can even write this without fear of retribution from some government agency, and you can read it, or not, without fear of being punished for having done so. This is not the case everywhere.

Each of us has our own, mostly petty, complaints about the tunes we must dance too – local, state or federal authoritarian voices too often shout down what we say or want to hear, but just as often speak up for us when needed most. It is what it is, and we as individuals don't count for much, but we do count. We can vote. And we can mostly say and do and go where we want. All in all – think about it. I like where I am. I'm thankful I'm not in a lot of places that make what I do dangerous on a daily basis, or impossible at all.

•

One of the things beekeepers do is watch what's blooming when. I'm pretty keen on both of those events – what and when. And I know there are lots of web pages that will tell me all manner of phenological events, Master Gardener pages, nursery pages, Extension pages – the list goes on. But the best record I have is a tattered, spiral bound notebook with dates and places and times and plants and a few just plain observations on what's going on. What bloomed when in my part of Ohio.

If you do this you know that, if you have enough years on those pages, things don't change too much, year to year. A day or two, maybe a week, seldom sooner, seldom later. That's OK. That some things are predictable is a good thing because they are, well, predictable. It's when something goes completely whacko that life gets interesting. And something did, here in northeast Ohio this year.

This year it was the locust bloom. You know, black locust, *Robinia pseudoacacia*. This native tree produces one of the finest, some (me among them) say absolutely the finest honey one can find. And one reason it is considered so fine is that it is so rare. There is an unwritten rule, at least here in Ohio, that it is supposed to rain every one of the seven to 10 days of bloom we normally have, and the bees simply sit at home and watch the blossoms come, and go, without so much as a drop to harvest. It did some of that this year – rain that is – but for the first eight days it was perfect foraging weather. Perfect. Warm, not too windy, not too humid but humid enough, and not too much rain, but just enough to keep us all honest.

What was spectacular was the number of blossoms on each and every tree. On the way to work I drive past a stand of locust trees on both sides of the road. On one side are the large, mature grandfathers that have been absolutely predictable for the 30 years I've been driving past them. I watch for their bloom starting a couple of weeks before Memorial Day and write it down when I first see color. Across the road there are the upstarts. Now about 15 years old, their bloom has been growing each year, but this year they were pretty mild compared to their parents across the road. Until this year.

The youngsters have always been a day or two behind the others. Predictable. But this year they were almost a week ahead of schedule, and four or five days ahead of their counterparts. And the number of blossoms was stupendous! Which got me to looking elsewhere. And everywhere I looked there were locust trees in bloom. Not just bloom, covered-in-snow bloom. Solid-white in bloom. Individual clusters were larger than normal, with more florets that were larger than normal too, and far, far more of all of them than I've ever, ever seen, on absolutely every tree. Whole hillsides were white. Solid white. Trees I didn't even know were locusts were white. Two huge trees right here on Root Company Property, off to the side by the tracks stood out

4th Of July.
Locust Bloom.
Wright Brothers.
The President's Strategy.
The 4th Of July.

like snowmen in July. Solid white they were, and tall and proud and as wonderfully fragrant as you can imagine.

There have been seasons when locusts started blooming on Memorial Day, and years when I've harvested locust honey on that same day. This year it was about a long week after Memorial Day when they finally let loose their pearly white petals in the midst of a torrential, tropical rain storm. The 2.5" we got in a two hour burst spread those neon white petals across lawns and roads and ponds and fields all in a single evening. Within the week it's time to check, and if ready, harvest this rare and delicate liquid. You move in slow motion on harvest day, dancing around the petaled snowfall, with drifts piled against fences and along curbs, littering streets and sidewalks. Pristine white for a day or two, then fading to tan and brown, then gone for another year, leaving behind only the best of all of the honeys for my bees and some for me.

And there will be the pails and pails of this exquisite, beautiful, incredibly clear locust honey. I've already tasted some, right from the hive, still warm and a bit thin. It dissolves on your tongue, melts in your mouth and bursts in an aroma you can smell and taste and feel all at the same time. I'll probably not share much of this season's locust crop. I'll keep if for those years when it rains for days and the bees again sit and watch. Then I'll break open a new jar, and slowly, slowly take a deep breath of this year's extraordinary harvest. And I'll recall again the fields and hills and streets of wonderful whiteness, wonderful fragrance, wonderful, wonderful locusts.

•

In early May Simon and Schuster, the Publishing giant in New York, released a new book by Pulitzer Prize winning author David McCullough entitled *The Wright Brothers*. This isn't a book review, or even a promotion for the book, but if the subject interests you and you haven't already, get a copy, you will not be sorry. McCullough is a historian by trade and an author by talent, issuing tomes on, among other subjects, *Truman, John Adams*, 1776, and *The Johnstown Flood*.

In his latest work, he details the lives and adventures of the Wright Brothers on their journey to the sky, bringing in a cast of characters and machines, adventures and mishaps and the daily lives of the people of the late 1800 and early 1900s. Part of that, of course, is their first flight at Huffman Prairie, in Dayton, Ohio. But let me preface that just a bit.

Previous to this event, A.I. Root had been in contact with the brothers for some time, and there is a large collection of their correspondence preserved in the Library Of Congress. There were a lot of creative people living then and it was a heady time in America.

In September, 1904 they told A.I. they were going to fly their new machine, not just forward like they did at Kitty Hawk, but forward, turning, and returning to the origin of the flight, unlike the straight shot in North Carolina A.I. felt compelled to go and watch. So he headed from Medina to Dayton in his Oldsmobile, and stood on the edge of the field with only one other witness – the airplane's engine mechanic – and watched as Wilber sprung his plane off the catapult, flew that plane a quite long distance, turned it 180 degrees, returned to his take off location and set it down right in front of A.I. as gentle as a landing bird.

Back home A.I. wrote of his experience, what he had seen, and what he thought for the future of the children of men. Flight. Incredible. He returned to Dayton and the Wright brothers in December with his story to check for accuracy. They approved. And in the Jan 1 and Jan 15 issues of this magazine, he published the first ever account of man's heavier than air flight. It is a small part of McCullough's book, but it is the center of the work. It is the first report. The first impression. The first.

Every day I come to work I walk past the bound copies of those January issues. Not once have I taken them for granted.

•

About the same time McCullough's book came out, just about a month ago now, the President released The National Strategy To Promote The Health Of Honey Bees And Other Pollinators, put together by the Pollinator Health Task Force. And I'm sure by now that you've heard and read and been told all about what's in the report. Ad nauseam. But I'm going to lay some ground work here for a story we are doing in December on the progress of this, and some of my thoughts on this a bit sooner. But first . . .

The strategy has three overarching goals and an Action Plan to accomplish them . . .

- Reduce honey bee colony losses during winter to no more than 15% within 10 years
- Increase monarch butterfly populations
- Restore or enhance seven million acres of land for pollinators over the next five years in SD, ND, MN, WI and MI.
- Actually, it has one more that is not part of the first three . . . Protecting Pollinators from exposure to pesticides. This is treated below.

This Strategy evolved from the Presidential Memorandum last June identifying these goals . . .

- Understand, prevent and recover from pollinator losses
- Expand public education programs
- Increase pollinator habitat
- Develop public/private partnerships

Increased funds for all of this are needed of course, and a budget is outlined, with 14+ Federal departments involved, increasing spending by $34 million in 2016 over 2015 for a total of $82 million. Of that, ARS is to get an increase of $7 million, with DOI, EPA and USDA getting the bulk of the rest.

Pesticides. In the Strategy document just released there is a separate section on Protecting Pollinators From Exposure to Pesticides. This got a lot of attention, right away. The day it was released a slew of environmental and related groups criticized the goals as not being strong enough in protecting pollinators in general, and honey bees in particular from neonicitinoids. At the same time, almost every farm group praised it for addressing what is really the problem with dying bees – *Varroa*. Nevertheless, even before the document

Continued on Page 90

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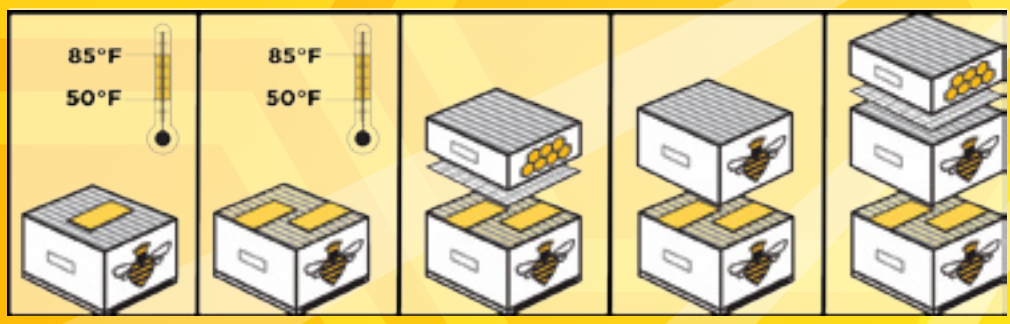

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HEALTHY BEES. HEALTHY PLANET.

It's Summers Time –

It's June 1 as I write this and we had to turn the furnace back on. It was only a high of 52°F today. Crazy weather here in Northeast Ohio. Two days ago it was so hot and humid that I wanted to stay in the house and turn on the AC.

We've had so much rain in the last couple of days that the "High Water" sign went up on our road and the creek just down the road was as full as I've ever seen it. And yes, there was water in the basement again.

The young ducks have been really happy though. It seemed like the harder it rained, the more they enjoyed themselves.

It's been interesting getting the ducks adjusted to life here or us getting adjusted to them. I told you last time that we were not really completely prepared, but things are working out. We were able to keep them confined until they were big enough to fend for themselves. And that has gone pretty well. Mostly the older chickens just ignore them. There is one Barred Rock in the young chick group that gets a little bossy! Kim has already threatened her with the soup pot if things don't improve. But so far no injuries, just some pushing and shoving.

When the ducks were tiny we had a small black pool made out of a heavy rubber. All six ducks could fit in there and swim around. Pretty soon only four could fit in there. So off we went to WalMart to buy a kiddy swimming pool. It had been a very long time since I bought one of those. Our youngest child is 28 years old!

Well, I thought they would be so excited about their new "pond" – not so much. We filled it up and as we placed each duckling into the pool they jumped out as fast as they could. They were completely freaked. We made ramps and steps so they could get in and out safely and easily, but they were not interested and would still take turns getting in and out of their tiny pool.

Each day after work I would head for the pen to see if they had figured it out. Finally, last week we got home one day and there they were in the big pool happily swimming and dunking and acting like real ducks. You can lead a duck to water, but you can't make him swim – until he's ready. They've also started to quack instead of peep. So things are progressing. Everybody is in one pen now and getting along OK.

Ducks are very entertaining. They travel as a unit. All six move smoothly together from place to place. If one gets left behind there is a huge ruckus until they catch up with the group.

They are turning into beautiful adults. Not exactly what we expected as far as coloring, but some really nice patterns and colors. All in all I'm glad we got the ducks. They're a lot of fun.

We had a heck of a thunderstorm last week. The young chickens were very startled by this. They hid under the wonderful Red Osier Dogwood in their pen and wouldn't come into the coop. The older chickens came in right away and the ducks just enjoyed the water – in the pool and the rain and didn't want to come in at all.

Just a reminder if you have chickens – be sure and check their feet. I was very diligent about this for the first couple of years, but I had gotten lax about it. Then I discovered that three or four of our old girls had gotten some clumps of dirt on the ends of their toes that harden to the point where they couldn't get it off. We got a warm pan of soapy water and stood them in and softened it up and that made it easier to remove. Actually they seemed to enjoy the "pedicure." They were very calm.

We'll be heading off this Friday to OR for the Mother Earth News Fair in Albany and then to CA to visit family. That along with the threat of major rainfall left us with a small window of time this past Saturday morning to get at least part of the garden in. That was the day it was so hot, but we forced ourselves to get out there and get it done. We put in about 20 tomato plants and lots of different kinds of squash and watermelon and peppers. We still have beans and herbs to do. We got stuff in just before it started to pour – in fact Kim got a little damp getting the last few squash in the ground.

We're still hopeful about the Summer, even though we have our jackets out and our furnace on. And, yes I'll still get whiny when it's too hot, that's just who I am.

My hope for you is a wonderful Summer filled with family, friends, good weather, healthy bees and a Happy Holiday.

The young chicks under the dogwood bush.

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A Closer LOOK

BEE HEALTH AND PESTICIDES

Clarence **Collison**

Pesticide exposure and pathogens may interact to have strong negative effects on colony health.

Honey bees are constantly exposed to pesticides, particularly if their colonies are located in agricultural areas. While bees are non-target organisms for most field pesticide applications; nevertheless, they can be exposed to pesticides while collecting pollen and nectar from flowers, collecting resins from various plants, drinking water from numerous sources, breathing, and during flight (if the pesticides are airborne) (Mullin et al. 2010; Gregorc and Ellis 2011).

Pesticide exposure and pathogens/may interact to have strong negative effects on colony health (Pettis et al. 2013). Such findings are of great concern given the large numbers and high levels of pesticides found in colonies. These chemicals may affect the synthesis, transport, action or elimination of natural molecules, such as hormones or enzymes that are responsible for maintaining bee development, immune mechanisms and behavior (Chauzat et al. 2009).

Another area of concern is the sub-lethal effects of acaricides used within the hive for the control of *Varroa* mites (Johnson et al. 2010). Acaricide levels can build up in the wax comb of colonies (Mullin et al. 2010), and low level exposure to these products can impair a colony's ability to rear queens (Collins et al. 2004), reduce sperm viability in drones (Burley et al. 2008), and impact the development and immune response of worker bees reared in contaminated comb (Desneux et al. 2007).

Numerous surveys have revealed high levels of pesticide residue contamination in honey bee comb. Wu et al. (2011) conducted studies to examine possible direct and indirect effects of pesticide exposure from contaminated brood comb on developing worker bees and adult worker lifespan. Worker bees were reared in brood comb containing high levels of known pesticide residues (treatment) or in relatively uncontaminated brood comb (control). Delayed development was observed in bees reared in treatment combs containing high levels of pesticides particularly in the early stages (day four and eight) of worker bee development. Adult longevity was reduced by four days in bees exposed to pesticide residues in contaminated brood comb during development. Pesticide residue migration from comb containing high pesticide residues caused contamination of control comb after multiple brood cycles and provided insight on how quickly residues move through wax. Higher brood mortality and delayed adult emergence occurred after multiple brood cycles in contaminated control combs. In contrast, survivability increased in bees reared in treatment comb after multiple brood cycles when pesticide residues had been reduced in treatment comb due to residue migration into uncontaminated control combs, supporting comb replacement efforts. These sub-lethal effects; delayed larval development and adult emergence or shortened adult longevity, from pesticide residue exposure can have indirect effects on the colony such as premature shifts in hive roles and foraging activity.

"Delayed development was observed in bees reared in treatment combs containing high levels of pesticides."

In a second study, honey bees reared from brood comb containing high or low levels of pesticide residues were placed in two common colony environments. One colony was inoculated weekly with *Nosema ceranae* spores in sugar syrup and the other colony received sugar syrup only. Worker honey bees were sampled weekly from the treatment and control colonies and analyzed for Nosema spore levels. Regardless of the colony environment (spores + syrup added or syrup only added), a higher proportion of bees reared from the high pesticide residue brood comb became infected with *N. ceranae*, and at a younger age, compared to those reared in low residue brood combs. These data suggest that developmental exposure to pesticides in brood comb increases the susceptibility of bees to *N. ceranae* infection (Wu et al. 2012).

Bees are particularly vulnerable to sublethal pesticide exposures because they gather nectar and pollen, concentrating environmental toxins in their nests in the process (James and Xu 2012). Pesticides do have effects on immunity.

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Perfect for use with your Comb Capper. Hang the bucket strainer inside your 5 gallon bucket. Then install the comb capper on the top rim of the bucket. The strainer will catch the large chunks of cappings and allow more honey to settle in the bottom.

Bottling Kit with extra bucket and gate

This kit provides a great way to filter, bottle and store all in one. Includes two 5-gallon buckets with lids, two 1-1/4" gates, 1 coarse filter, and 1 fine filter.

Clear Plastic Jars with Caps (2 Cases)

2 cases of clear plastic 8 oz containers. Includes a 38mm yellow snap-top lid and inner seal.

Labels for Honey Jars

Self adhesive labels make the process quick and easy. 40 labels per package

*

"These data suggest that developmental exposure to pesticides in brood comb increases the susceptibility of bees to N. ceranae infection."

Organophosphates and some botanicals have been found to impact hemocyte number, differentiation, and thus affect phagocytosis. The phenoloxidase cascade and melanization have also been shown to be affected by several insecticides. Many synthetic insecticides increase oxidative stress, and this could have severe impacts on the production of some antimicrobial peptides. Pesticides can also affect grooming behaviors, rendering bees more susceptible to disease.

To further understand potential interactions between pesticides and bee pests/pathogens, Gregorc et al. (2012) determined physiological responses of bees to chemical and biological threats by measuring gene expression after exposure to the parasitic *Varroa* mite and a suite of pesticide threats. The tested pesticides (with pesticide class in parentheses) included two fungicides [myclobutanil (azole), chlorothalonil (substituted benzene)], two herbicides [simazine (triazine), glyphosate (phosphonoglycine)], and five insecticides/miticides [fluvalinate (pyrethroid), imidacloprid (nicotinoid), coumaphos (organophosphate), chlorpyrifos (organophosphate), amitraz (amidine)] and represent a range of modes-of-action and pesticide families. Three of these compounds (amitraz, fluvalinate, and coumaphos) are often used by beekeepers to control *Varroa* mites and/or small hive beetles in colonies. The other chemicals are used commonly in agricultural settings and, with the exception of glyphosate, have been found as residues in honey bee colonies (Mullin et al. 2010). Honey bee larvae reared in vitro (Latin: in glass; experiments done in a cell-free system) were exposed to one of these nine pesticides and/or were challenged with *Varroa* mites. Total RNA was extracted from individual larvae and first strand cDNAs were generated so that gene-expression changes in the larvae could be measured targeting transcripts (RNA copy of a gene sequence) for pathogens and genes involved in physiological processes, bee health, immunity, and/ xenobiotic (chemical substances that are foreign to the body) detoxification. Transcript levels for Peptidoglycan Recognition Protein, a pathogen recognition gene, increased in larvae exposed to *Varroa* mites and were not changed in pesticide treated larvae. As expected, *Varroa*-parasitized brood had higher transcripts of deformed wing virus than did control larvae. *Varroa* parasitism, arguably coupled with virus infection, resulted in significantly higher transcript abundances for the antimicrobial peptides abaecin, hymenoptaecin, and defensin 1. Transcript levels for Prophenoloxidase-activating enzyme, an immune end product, were elevated in larvae treated with myclobutanil and chlorothalonil (both are fungicides). Transcript levels for Hexameric storage protein (Hsp70) were significantly upregulated in imidacloprid, fluvalinate, coumaphos, myclyobutanil, and amitraz treated larvae. Definitive impacts of pesticides and *Varroa* parasitism on honey bee larval gene expression were demonstrated.

Chauzat et al. (2009) conducted a three-year field survey in France from 2002 to 2005, to study colony health in relation to pesticide residues found in the colonies. Pesticide residue levels were determined in honey, pollen collected by bees, beeswax and bees. When all samples were pooled together, the number of pesticide residues detected per sampling period (four sampling periods per year) and per apiary ranged from 0 to 9, with the most frequent being two (29.6%). No pesticide residues were detected during 12.7% of the sampling periods. Residues of imidacloprid and 6-chloronicotinic acid were the most frequently detected in pollen loads, honey and bee samples. Several pairs of active ingredients were present concurrently within honey bees and in pollen loads but not in beeswax and honey samples. No statistical relationship was found between colony mortality and pesticide residues.

Chauzat and Faucon (2007) analyzed beeswax for pesticide residues in their French apiary survey. Beeswax samples were collected once a year over two years from a total of 125 honey bee colonies. Multi-residue analyses were performed on these samples in order to identify residues of 16 insecticides and acaricides and two fungicides. Residues of 14 of the searched-for compounds were found in samples. Tau-fluvalinate, coumaphos, and endosulfan residues were the most frequently occurring residues (61.9, 52.2 and 23.4% of samples, respectively). Coumaphos was found in the highest average quantities (792.6 µg/kg). Residues of cypermethrin, lindane and deltamethrin were found in 21.9, 4.3 and 2.4% of samples, respectively. Statistical tests showed no difference between years of sampling, with the exception of the frequency of pyrethroid residues. Beeswax contamination was the result of both in-hive acaricide treatments and, to a much lesser extent, environmental pollution.

Chauzat et al. (2006) also tested pollen from these 125 colonies. For three years, the colonies were sampled four times per year. Pollen loads from traps were collected at each visit. Multi-residue analyses were conducted to search for residues of 36 different molecules. Specific analyses were conducted to search fipronil and metabolites and also imidacloprid and metabolites. Residues of 19 searched compounds were found in samples. Contamination by pesticides ranged from 0 to 50%. Coumaphos and tau-fluvalinate residues were the most concentrated of all residues (mean concentrations were 925.0 and 487.2 µg/kg, respectively). Fipronil and metabolite contents were superior to the limit of detection in 16 samples. Residues of fipronil were found in 10 samples. Nine samples contained the sulfone compound, and three samples contained the desulfinyl compound. Residues of imidacloprid and 6-chloronicotinic acid were found in 69% of samples. Imidacloprid contents were quantified in 11 samples with values ranging from 1.1 to 5.7 µg/kg.

6-Chloronicotinic acid content was superior to the limit of quantification in 28 samples with values ranging from 0.6 to 9.3 µg/kg.

During 2007 to 2008, Mullin et al. (2010) actively sampled beebread, trapped pollen, broodnest wax, beeswax foundation, and adult bees and brood for pesticide residues. These samples were drawn largely from commercial beekeepers

from 23 states and one Canadian province, and included samples from apparently healthy colonies as well as from operations that were diagnosed as having colony collapse disorder. Included in this survey were dead bees collected from local or community applications of insecticides. A total of 121 different pesticides and metabolites within 887 samples of wax, pollen, bee and associated hive samples were found. Almost 60% of the 259 wax and 350 pollen samples contained at least one systemic pesticide, and over 47% had both in-hive acaricides fluvalinate and coumaphos, and chlorothalonil, a widely-used fungicide. In bee pollen, chlorothalonil was found at levels up to 99 ppm and the insecticides aldicarb, carbaryl, chlorpyrifos and imidacloprid, fungicides boscalid, captan and myclobutanil, and herbicide pendimethalin at one ppm levels. Almost all comb and foundation wax samples (98 %) were contaminated with up to 204 and 94 ppm, respectively, of fluvalinate and coumaphos, and lower amounts of amitraz degradates and chorothalonil, with an average of six pesticide detections per sample and a high of 39. There were fewer pesticides found in adults and brood except for those linked with bee kills by permethrin (20 ppm) and fipronil (3.1 ppm).

Honey bees can be exposed to multiple chemical agents simultaneously (Mullin et al. 2010), synergistic or antagonistic interactions among these pesticides

"Almost all comb and foundation wax samples (98%) were contaminated with up to 204 and 94 ppm, respectively, of fluvalinate and coumaphos."

or between pesticides and bee pests/pathogens could also play a role in the bee and colony health (Johnson et al. 2009). Alaux et al. (2010) published physiological evidence that the insecticide imidacloprid and the fungal pathogen Nosema can interact synergistically to affect bee health negatively, including physiological changes initiated by pesticide exposure that decreased bee tolerance toward Nosema infection. Similarly, Pettis et al. (2012) showed an increase in Nosema spore loads in colonies treated with imidacloprid. Research has also shown that bees consuming pollen with high fungicide loads have an increased probability of Nosema infection (Pettis et al. 2013). In the past we have normally considered fungicides to be fairly safe for honey bees.

To address beekeeper concerns about pesticide residues in overwintered honey, paired samples were obtained from the extracting honey supers and brood chamber of the same colony (Ostiguy and Eitzer 2014). Only eight residues were detected: coumaphos, fluvalinate, boscalid, dimethoate, atrazine, bentazon, dichlorobenzene and thymol. Honey from extracting supers was significantly less likely to contain pesticide residues than in honey from brood comb. Fluvalinate was detected only in overwintered brood comb honey, and coumaphos was found at significantly higher levels in the overwintered samples from the brood comb-honey super pairs. Pesticide residues in honey, while low in comparison to other substrates in the hive, contribute to the overall pesticide exposure of honey bees, with overwintered brood comb honey contributing more than honey stored in other locations in the hive. BC

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MOSQUITO ABATEMENT PROGRAMS

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Michele **Colopy**

It is Summer in the city, and local governments have started their mosquito abatement programs. Concerned for public health, municipalities spray insecticides and larvicides through communities to control mosquitoes. While some communities have pro-active programs to alleviate standing water and other breeding areas for mosquitos, the preferred practice is to spray and fog our cities, roadways, ditches, and waterways with pesticides. Of the typical pesticides used for mosquito control, most are applied by trucks spraying the product as it drives down your street, or along the side of the road. A random perusal of various state and city mosquito abatement processes conflict as to the "best time" to apply the pesticides in order to cause the least harm to honey bees and native pollinators. Sadly, far too many of the extension documents and state guidelines claim bees are not active after 3 p.m. which is just blatantly false. Honey bees and native pollinators will forage blooming plants until the sun sets. To fully protect honey bees and native pollinators from mosquito control pesticides, the pesticide should only be applied when it is dark: the sun has set and the street lights are lit. Dark is dark, not twilight, not sunset: dark.

Community Controls

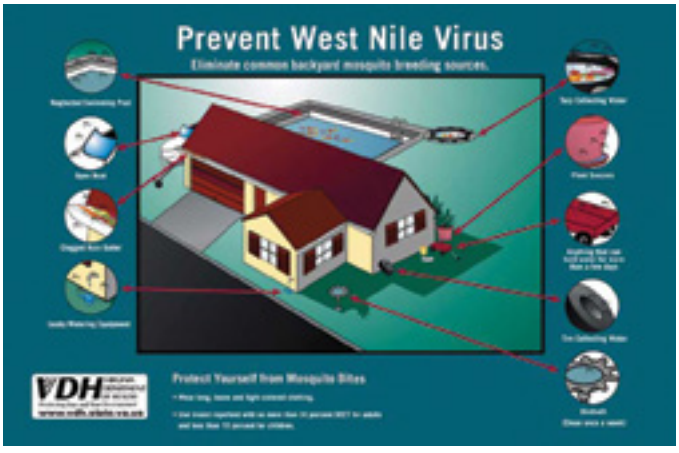
Some cities like Boulder, Colorado, post actions residents can take to protect themselves from mosquitos, and how to reduce the use of pesticides on their person and property. These mitigation measures reduce the habitat for mosquitoes, thereby reducing the exposure to mosquitoes. Personal mitigation measures require individuals to take action to protect themselves. County mosquito control spray programs may expand the prophylactic use of pesticides across more of the ecosystem. Individuals should remove trash and standing water on their own property in order to protect themselves and others from mosquitos, and to protect pollinators from mosquito control products.

Bee kills across the U.S. in agriculture are typically due to tank mixes and prophylactic use of pesticides on plants grown from pesticide coated seeds. In urban and suburban areas, mosquito abatement practices are causing unnecessary bee kills. Some cities offer beekeepers the opportunity to "opt-out" of mosquito spray applications near their property. However, the "opt-out" process is sometimes cumbersome. One Massachusetts community went from 400 people opting out, to only 100 opting out the following year due to a change in the application process requiring certified letters to be sent to the local government. Other communities provide a sign to you to post at each end of your property so county workers will not spray between the signs (your property frontage). However, they continue to spray before and after your property signs. Even if a beekeeper opts out of having their property sprayed for mosquitoes, pesticides drift onto water and blooming plants. Not all mosquito control products have a short residual toxicity, and can last more than eight hours on the blooming plants and in water. The next day when bees drink from a puddle or stream, or collect nectar from a bloom containing a mosquito control pesticide, the honey bee or native pollinator may die.

Water for Honey Bees

Many mosquito control products speak to addressing mosquito larvae in water, and then imply the pesticides in the water will not harm bees. Bees do drink water. So, if a pesticide lingers in the water, bees will encounter the pesticide there, as well as on blossoms, and guttation droplets on plants. Far too many mosquito control documents ignore the fact bees drink water, and mislead the pesticide applicator stating bees stay in their hives after 3 p.m. Those two issues lead to great harm being caused to honey bees and native pollinators. Every living creature needs clean, pesticide free water to drink; and "busy as a bee" means on warm, hot days they work from sunrise to sunset, and they need water to cool the hive, and themselves.

A study of mosquito control products effect upon coastal water showed how pesticides and the water can interact to create a more toxic situation. Research published in the *Archives of Environmental Contamination and Toxicology* "*determined that lower oxygen*



from ***www.co.jackson.ms.us.jpg***

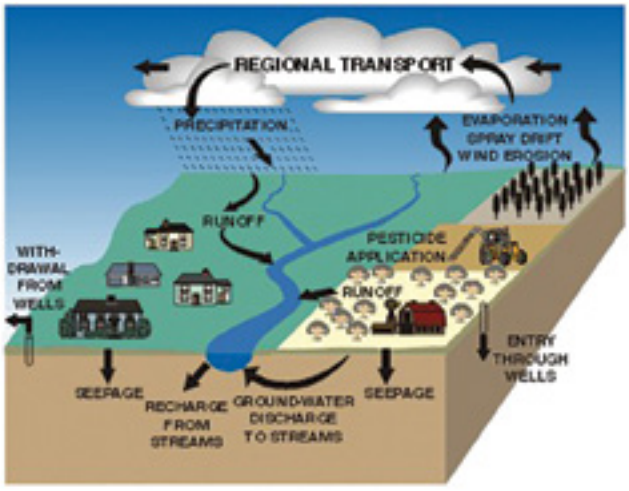
levels in water, known as hypoxia, and increased acidification actually increased how toxic some of the pesticides were."[1] This study of mosquito control products along coastal areas found differences in sensitivity *"between chemicals, species, and life stages"* in clams and oysters due to drift overspray or unintentional drift into coastal waters of mosquito control pesticides. While this study showed decreased swimming activity after four days in oysters, and decreased growth in clams and oysters after 21 days, the researchers calculated a low-level risk to oysters and clams *"from application of these pesticides for mosquito control."* The researchers did note *"The more extreme climate conditions caused increased pesticide toxicity."*[2] While this study is of clams and oysters, the changes in the water and the pesticides show an increased toxicity. Honey bees live near coastal areas, and drink from the waters draining into these estuaries.

The U.S. Geological Survey Water Science School exclaims water plays an important role in the movement of pesticides as *"it is one of the main ways that pesticides are transported from the areas where they are applied to other locations, where they may cause health problems."* As many larvicides are applied to water, where mosquitos breed we create a toxic water source for our honey bees and native pollinators. *"Pesticides can reach water-bearing aquifers below ground from applications onto crop fields, seepage of contaminated surface water, accidental spills and leaks, improper disposal, and even through injection waste materials into wells."* states the USGS Water Science School. As many bee kills are the result of tank mixes of herbicides, insecticides, and fungicides, *"Some pesticides have had a designated maximum Contaminant Limit (MCL) in drinking water set by the U.S. Environmental Protection Agency (EPA), but many have not. Also, the effect of combining more than one pesticide in drinking water might be different than the effects of each individual pesticide alone. It is another situation where we don't have sufficient scientific data to draw reliable conclusions."*[3]

Fifty percent of the U.S. population *"obtains its drinking water from groundwater sources and as much as 95% of the population in agricultural areas uses groundwater as its source of drinking water."*[4] The Safe Drinking Water Act sets standards for drinking water in public water supplies. *"Private water supplies are not monitored or regulated by this Act."*[5] The consumer or well owner is responsible for monitoring their own water supply for contaminants. We, therefore must be aware of the drinking supply for our honey bees.

Mosquito Control Pesticides

Typical mosquito control products listed on local government mosquito control websites are: methoprene, Bti, Bsp, temephos, sumithrin, malathion, permethrin, and chlorpyrifos. Not all of these products are applied individually, and even if they are, they are always mixed with surfactants or oils, and "other ingredients" for which there is little information.



Pathways of ***pesticide*** *movement in the hydrologic cycle from* ***www.pubs.usgs.gov***

Summary of some mosquito control pesticides:

1. methoprene - (affects the development of egg/larva) moderately to highly toxic to fish and crustaceans; relatively non-toxic to birds; low toxicity to adult bees, but bee larvae may be more sensitive.
2. Bti (Bacillus Thuringiensis) - not toxic to bees, has been used in hives for control of wax moth. However, "very high concentrations of B.t. var. tenebrionis, which is used against beetles such as the Colorado potato beetle, reduced longevity of honey bee adults but did not cause disease." Initial studies also did not show results of Bti upon native pollinators such as butterflies.
3. Bsp (Bacillus sphaericus) - not toxic to bees
4. temephos - highly toxic to bees, aquatic organisms, and is moderately to highly toxic to birds.
5. sumithrin - extremely toxic to bees, aquatic life, and poisonous to cats and dogs.
6. malathion - highly toxic to bees, and to freshwater and estuarine aquatic organisms, moderately toxic to birds.
7. permethrin - toxic to fish and bees
8. chlorpyrifos - very highly toxic to bees, birds, freshwater fish and invertebrate

"Insecticide toxicity is generally measured using acute contact toxicity values LD50 – the exposure level that causes 50% of the population exposed to die. Toxicity thresholds are generally set at:

- highly toxic (acute LD50 < 2µg/bee)
- moderately toxic (acute LD50 2 - 10.99µg/bee)
- slightly toxic (acute LD50 11 - 100µg/bee)
- nontoxic (acute LD50 > 100µg/bee) to adult bees."[6]

One mosquito control product is a combination of prallethrin, Sumithrin® and piperonyl butoxide. The label clearly states: *"This pesticide is highly toxic to aquatic organisms, including fish and aquatic invertebrates. Runoff from treated areas or deposition of spray droplets into a body of water may be hazardous to fish and aquatic invertebrates.*

Do not apply over bodies of water (lakes, rivers, permanent streams, natural ponds, commercial fish ponds, swamps, marshes or estuaries), except when necessary to target areas where adult mosquitoes are present, and weather conditions will facilitate movement of applied material beyond the body of water in order to minimize incidental deposition into the water body. Do not contaminate bodies of water when disposing of equipment rinsate or wash waters. This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply to or allow drift onto blooming crops or weeds when bees are visiting the treatment area, except when applications are made to prevent or control a threat to public and/or animal health determined by a state, tribal or local health or vector control agency on the basis of documented evidence of disease causing agents in vector mosquitoes, or the occurrence of mosquito-borne disease in animal or human populations, or if specifically approved by the state or tribe during a natural disaster recovery effort."[7]

The Pollinator Stewardship Council has previously pointed out EPA approved labels that start out protecting pollinators, and then include "exceptions" allowing for pollinators to be sacrificed. Even in the above label's environmental hazard statement the two exceptions: to apply to bloom, and to water, are allowed with full understanding honey bees and native pollinators will be killed. A public health emergency allows for the exceptions to occur and application of the product made against the label protections for pollinators. Communities must ensure they are truly protecting human health. Ask your local Health Board if they are trapping and testing mosquitoes for disease. If diseases are *not* found in mosquitoes, then tax dollars should not be wasted applying a pesticide when it is not needed. Prophylactic use of pesticides is as problematic as prophylactic use of pharmaceutical drugs. Regular use depletes their ability to work.

We can protect human health, and we can protect honey bees. Beekeepers should be able to protect their honey bees from mosquito control products. As a community we should protect our native pollinators. As individuals we can be proactive to protect our property from mosquitoes, and protect our honey bees and pollinators from the adverse impact of mosquito abatements. If a health risk is established, a short residual toxicity mosquito control product should only be applied after the sun has set, when it is dark. Only then will honey bees and native pollinators have a chance to survive mosquito abatements.

If you experience a bee kill due to a mosquito abatement program in your community: report it! Refer to the Quick Guide for Reporting A Pesticide-related Bee Kill **http://pollinatorstewardship.org/?page_id=3292** BC

[1]National Oceanic and Atmospheric Administration, "NOAA scientists find mosquito control pesticide use in coastal areas poses low risk to juvenile oyster, hard clams, Climate stressors, however, increase risk to shellfish," June 9, 2014, **http://www.noaanews.noaa.gov/stories2014/20140609_mosquitoinsecticide.html**

[2]Ibid

[3]Pesticide in Groundwater, The USGS Water Science School, **http://water.usgs.gov/edu/pesticidesgw.html**

[4]Pesticide Residues in Drinking Water, Extoxnet FAQs **http://extoxnet.orst.edu/faqs/safedrink/pest.htm**

[5]Ibid

[6]Pollinator protection requirements for Section 18 Emergency Exemptions and Section 24(c) special local need registration in Washington State; Registration Services Program Pesticide Management Division Washington State Dept. of Agriculture, Dec 2006; Hunt, G.J.; Using honey bees in pollination Purdue University, May 2000

[7]Sample Label for Duel action adulticide **http://www.cabq.gov/environmentalhealth/documents/duet_label.pdf**

Other resources:

Pesticides Used in Mosquito Control from the National Pesticide Information Center **http://npic.orst.edu/pest/mosquito/mosqcides.html**

Water Quality Assessment and Total Maximum Daily Loads Information **http://www.epa.gov/waters/ir/index.html**

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Late Spring Colony Loss

Pesticides, Starvation, or Something Else

Dewey **Caron**

In mid-June, last year there was a sudden loss of adult bees in at least ½ dozen apiaries in the Sandy/ Estacada area of Clackamas County, east of Portland Oregon. Losses were sudden, involving the entire hive adult population or a significant portion (¾ or more) of the adults. Although the beekeepers intervened with feed once the loss was discovered, colonies still with living adults did not recover. Thinking pesticides, the beekeepers contacted the Pesticide division of Oregon Department of Agriculture asking them to investigate.

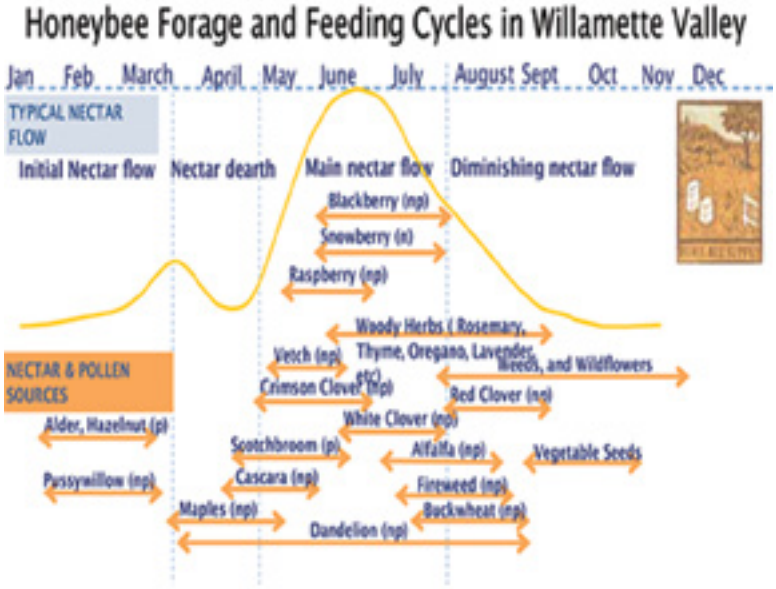
Most dead bodies were within the hive (not out front) piled on the bottom board and filling ½ the lowest box, blocking off the colony entrance. There were some dead bees on the inner cover and some bees were head-in in vacant cells. Some bees had an extended proboscis and disoriented and convulsing bees were noted. Dead and dying brood was evident. Robbing was not evident. The initial inspections assumed pesticide kill but losses did not quite fit a pesticide loss.

Other than the sudden loss, there were no commonalities discernable – beekeeper owners had different years of beekeeping experience, different hive types (two top-bar hives and one Warré hive were among those lost), the bees were established from different sources, most had been fed sugar syrup when colonies were newly hived and the locations, while all in the Cascades foothills (300 to 500 feet elevation), were not within the same forage diameter. The area has a number of nurseries but lots of open space, river bottoms and forage availability within sight at time of sudden loss.

The Oregon State Beekeepers were asked by the ODA pesticide investigator for opinion as to what might have occurred within a few days of the initial losses with concurrence of the hive owners. Our skills at autopsy of a dead bee hive are not very advanced so when looking to do a post-mortem, I am making an "educated guess." It is not always possible to conclude with certainty the reason for the sudden loss. I often say something like 95% likelihood of this cause or 75% one likely cause but 25% possibly for another alternative. The longer after an event the colony is examined, the less certain I can be about what might have happened.

In looking at a hive with a sudden change, I (like the beekeeper) was looking for "normal" and what about what is being viewed is abnormal – abnormal in what ways? I started with some assumptions as to why there might be a sudden loss of adult bees. In early Spring, a colony loss is likely due to Winter starvation. In the active season, a sudden loss is usually due to pesticide exposure, while later in the Summer into the Fall season, when resource conditions are poor, I first think robbing behavior. In later fall absconding or CCD. But there can be alternative explanations other than the "expected" one – we all know bees can seemingly do the strangest things that defy the "normal" explanation. CCD and absconding are two examples of such uniquely different conditions.

Looking closely at two of the incidences, contrary to expected typical pesticide exposure loss, it was evident that only some of the colonies in apiaries with more than one colony had the sudden loss. Colonies showed dying brood and some EFB brood disease but not in any large quantity, certainly not the IBDS or snot brood condition. Interestingly, stores of capped honey and cells of bee bread were noticeably absent, in both those with losses and in colonies still seemingly OK. All the colonies examined, those with losses and those without any discernable loss, were actively building comb and all had prolific queens that were seeking



Colony with dead bees – entrance is blocked with dead adults half way up inside lowest box.

to utilize every appropriate cell to lay eggs (i.e. pushing the workers to feed and care for a large amount of brood). Colonies were 'living on the edge'.

The ODA pesticide inspector called to investigate these incidences as a pesticide kill took fresh samples since pesticide loss was the best "call" given time of year and the sudden heavy adult bee loss. Analysis for 39 common pesticides, known to be hazardous to honey bees and likely to have been used in Oregon, was performed in the ODA pesticide testing lab in Portland. Laboratory analysis however found "no detection of pesticides." Analysis by samples sent to the OSU Bee Lab for pests and diseases "found average levels of bee mites and Nosema disease." ODA pesticides program manager Dale Mitchell concluded "We're really left without any concrete evidence of what affected those particular hives."

Consulting other beekeepers with more experience in the Cascades foothills, revealed that colony starvation, while not common, has been noted in some seasons. There is often a Spring dearth period April into May in this region, a micro-climate different from locations at lower elevations. George Hansen, past president of the American Beekeeping Federation, also a Cascades foothills beekeeper, has developed a seasonal management graph that clearly illustrates this dearth. The dearth however is usually earlier in season than this mid-June die-off. When I looked at weather records just before the first losses were noted, several days where maximum temperature was only 60-62°F were recorded at the nearest airport. This area tends to be cloudier and Pacific fog lingers longer in these foothills

I noted that in one apiary of four colonies in Langstroth hives, two had been given frames of honey at transfer from the cardboard nucs (all purchased from same supplier) and these two colonies had stores and needed supering. The two colonies not supplied honey had only partially drawn plastic foundation frames in two months. There were absolutely no stores present in these two colonies. The one colony with the sudden loss had a queen and newly emerged young adults four days after the loss event. When they were given a frame of honey, they did not quickly recover, as might be expected in a starvation situation. When a newly captured swarm was hived on the same equipment, it absconded within four days.

*Warre hive frame – lots of brood but no food stores. (*Photo by Casey O'Hara)

In another apiary of eight (+ one feral) colonies, on a 60 acre sustainable farm within Portland's watershed, two colonies (one a Langstroth and another a Warré hive) both had sudden bee loss. The Warré hive was "heavy" when hefted two weeks previous to loss but had no stores, though lots of brood, when they collapsed. The Langstroth hive had been fed upon establishment until they stopped taking syrup. They had a queen with a small adult population still alive when loss was discovered but sugar syrup added at top did not rescue them.

So the bottom line was a sudden loss of a significant number of adults in several apiaries, which in June usually means a pesticide loss. However hive examination showed enough non-typical symptoms to suggest that perhaps this was an unusual late spring starvation. What started as a 95% likely pesticide loss was now a 75% starvation "guess."

Pesticide loss cannot be absolutely ruled out. Colony stress from rapid Spring development, prolific queens, a late Spring dearth period, along with need for extensive brood feeding and comb drawing, meant a condition where colonies were living on the edge, needing a continuous inflow of nectar and pollen. While extensive, the ODA pesticide analysis did not include every possible chemical pesticide that bees might have been exposed to. Bees from colonies living on the edge might explore alternative forage and might be more at risk of pesticide exposure those bees from other colonies in the same apiary, with more ample stores.

At least one media report reported (once testing for pesticides came back negative) that it was beekeeper error – specifically failure to adequately feed the colonies. But that too is not valid because it too doesn't quite fit. Some of the colonies had been given some feed at establishment. At the time of loss none of the colonies had feeders. There is no set standard of how much colonies should be fed and feeders on colonies this late into the Spring usually are merely ignored by the bees in favor of flower resources. One dead colony had been fed until they stopped taking the syrup. The top-bar hives had virtually no supplemental feed, as it is very difficult to feed bees in such hives but some syrup

had been provided to the Warré hive. Rapidly expanding colonies, with lots of brood and need for comb building, often have over-extended adult populations and unbalanced brood to adult population ratios.

Two of the beekeepers had contacted media as well as OR Department of Agriculture. In one apiary, TV people were there to record our hive inspection. This has however backfired. One beekeeper identified as having lost two colonies has been subjected to some nasty blog comments and email messages. It is becoming commonplace for the comments following media reports to get "captured" by individuals with some agenda. One OR newspaper quoted an OR beekeeper as saying the hobbyists didn't know what they were doing and "raised the red flag of pesticides" when their bees died –Don't go throw a (hive) box in the backyard and run to the Pesticide Division when they all die . . . That is beekeeper error, that's what it is, 100 percent.

Although we WANT individuals to report these incidents – when unsubstantiated opinion comes to point the finger of blame on the individual reporting the incident, the message becomes garbled – should we SHUT UP and SUFFER in SILENCE or RISK being called part of the problem rather than a means to the solution. Other individuals in the foothills had similar losses but did not wish to report their damage or have their losses investigated. Loss report is vital – EPA at one point was assuming no pesticide problem unless there were complaints filed. The Pollination Stewardship Council has sought to even support pesticide analysis of dead bees to gather better statistics on pesticide losses being suffered (largely in silence) by beekeepers.

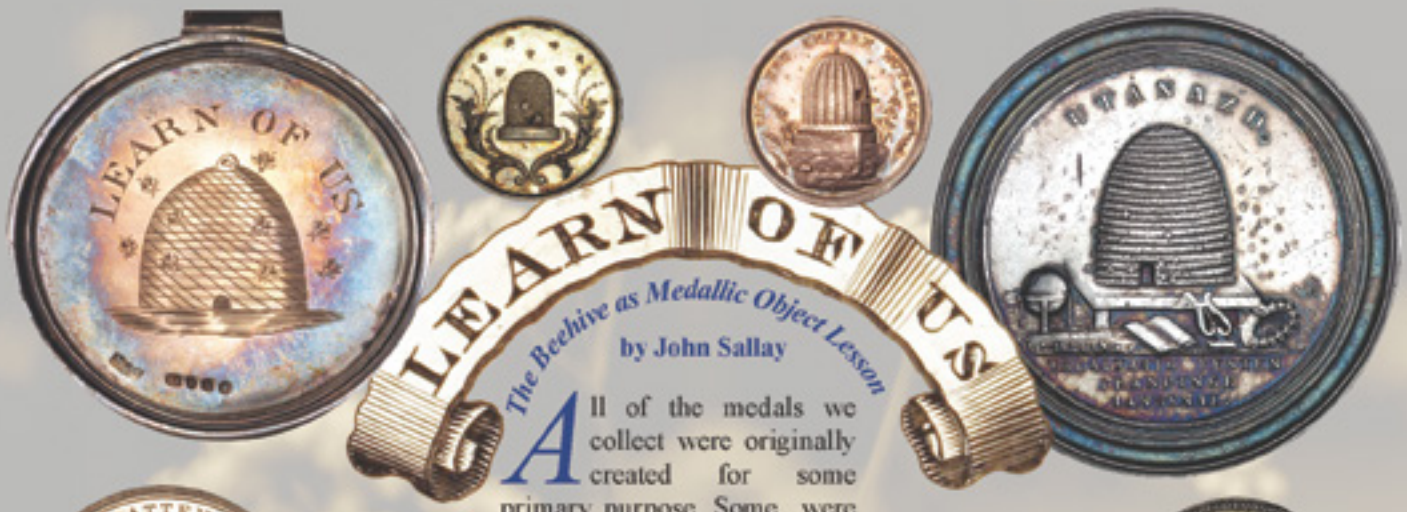
Reasons beekeepers elect NOT to report pesticide damage vary. They may fear loss of their apiary site, a pollination contract, a farmer friend. They have suffered from opinions from fellow beekeepers – recall the ppb label of beekeepers initially reporting CCD losses. And when their dead colonies are looked at by regulatory officials, the beekeeper may be found in violation of some regulation/ordinance/"illegal mite treatment and end up suffering legal consequences – a double whammy – to go along with the loss of their bees.

I don't know what happened in this region in this incident. The field examination did not fully support pesticides or starvation. I am not, however, about to blame individual beekeepers who all saw (and reported) the same thing – that it was their fault their bees died. We all know bees colonies die and the symptoms to diagnose the reasons are not at all clear-cut. It is however heartening to have the regulatory agency consider bringing in beekeepers with experience to join in an investigation when symptoms just don't seem to fit.

I was one of the individuals involved in the initial investigations and discussion of what came to be labelled BEE PMS (in early 2000s) and with the national discussion that lead to initial elucidation of CCD in early 2007. Neither PMS nor CCD fit the 'expected' loss pattern/symptoms. While these late-Spring OR losses do not fit either BEE PMS or CCD, it seems only a 50%-50% best guess pesticide damage or starvation. Could it, however, be something unusual and different?

Unfortunately we may never know, although we continue to look for a more complete definition. BC

Dewey Caron works with Extension at OR State University and is Professor Emeritus of University of DE.



LEARN OF US

The Beehive as Medallic Object Lesson

by John Sallay

All of the medals we collect were originally created for some primary purpose. Some were commemorative, some awards, some commercially produced for sale to collectors or tourists, and others were purely artistic expression. Among school award medals, a number were also intended – or perhaps even primarily intended – to be instructive. They were designed to reinforce important lessons, values, or behaviors in the children who received them. One favorite device was the beehive, symbolizing the virtues of diligence and cooperation.

Bees were hunted for their honey in prehistoric times, and ancient Egyptians began keeping bees nearly five thousand years ago. The first man-made beehives were probably fashioned from hollow logs, mimicking the honeybee's own natural hives. Fired clay pipes and pots were used as beehives by the ancient Greeks and Romans, with skeps becoming predominant by the Middle Ages and used extensively until the Langstroth wooden box hive with removable frames was invented in the mid-19th century. A skep – our traditional image of a "beehive" – is a half egg-shaped basket woven of straw or other grasses, which is placed upside-down on a stand or in a wall niche, with a small entrance opening for the bees at the bottom edge.

In Roman times, bees became a potent symbol of dedicated hard work, cooperation and harmony. A bee colony is a super-organism, often exceeding 50,000 workers, where no individual can survive independently, and every member of the colony has an important job to perform. Even the queen is not self-sufficient, requiring several attendant female workers to feed, warm, and protect her, and a few male drones to…well, you know (and *nothing* but that, incidentally). Because of this nearly unique community behavior and their perceived diligence, bees or their beehives have







been adopted as central iconography by several well-known organizations that value these traits, such as the Freemasons and Mormons (and subsequently the State of Utah).

Given the bees' diligent, hardworking, community-oriented behavior, it is not surprising that the beehive was often used as the central device on school award medals. Beehives were certainly not the only symbols used, but they came close to being the perfect cultural object lesson for children in the late-18th through the 19th centuries, as primary education became more universal. German-speaking European countries, England and its North American offshoots, the United States and Canada, produced the greatest number of these beehive medals, but examples are also known from Denmark, Hungary, and a few other countries.

While the beehive itself was sometimes enough to get the idea across, more often the intended message is spelled out explicitly. For example, many of the English medals have legends like a simple "Industry", "Learn Of Us", and/or "Learn To Live". Others have a more elaborate legend such as "By Industry We Live, By Perseverance, Excel" or "From Labour & Industry Great Blessings Flow". The German, Danish, and Hungarian medals tend to have a message more like "useful to themselves and others" in their native language or Latin. One of the more delightful pieces, by Joseph Davis, shows a boy on the obverse studying in front of a bust of Franklin and the legend, "God Giveth All Things To Industry"; on the reverse is a beehive surrounded by the continuation of the Franklin quotation, "Then Plough Deep While Sluggards Sleep And You Shall Have Corn to Sell And To Keep". BC

So Learn Of Us Indeed!



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was paid to beekeepers in 2014 – were you one of them?

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10 Year Payment History

example for grid 20138 Merced County, CA

2014	$34.90
2013	$78.00
2012	$34.36
2011	$14.69
2010	– 0 –
2009	$18.94
2008	$55.70
2007	$44.26
2006	$34.73
2005	$27.45

10 Year Average payout per hive
$34.30
- 15.35 cost
Average Profit **$18.95** per hive

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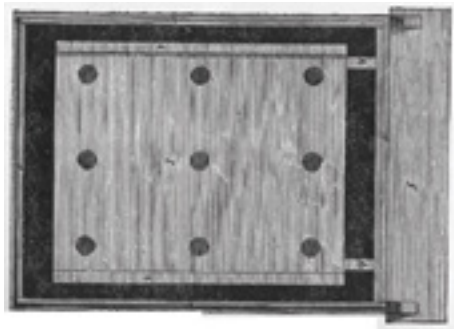
HONEY BOARDS, EXCLUDERS, ESCAPE BOARDS AND INNER COVERS

Jim **Thompson**

What a title! Would you believe that all of the terms were the same at one time or another? If we take a look at one of the hives that Lorenzo L. Langstroth made in 1853, we see that there is a honey board and an inner cover. The honey board was placed over the frames in the lower hive and had nine holes in it. Each hole was counter bored with a larger diameter hole at the top.

When Reverend Langstroth designed the honey board, there was a metal plant near his house in Philadelphia that cut holes in metal and threw away the metal discs. Reverend Langstroth was able to obtain the discs and use them in the honey board to temporarily seal off the holes. Therefore he could stop all traffic into the second super by sealing off all nine holes, stop the queen from going into the second super by sealing off the center holes, or leave all the holes open for free travel of the bees.

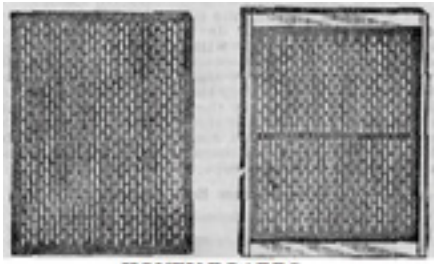


No. 5 Langstroth Hive, showing honey board

For many years, many other hives were made with a solidly fixed board containing a hole over the brood area. A beekeeper could slide a small box with an open bottom into the space above the hole. The bees would go into the box and build comb in the box and fill the comb with honey.

When the beekeeper determined that the box was full of honey, a knife or metal slide would be inserted below the box so the honey comb would be cut and the box would be removed. Yes, that solidly fixed board was called a honey board and its purpose was to keep the queen down by providing a distance for the queen to travel. It was not 100% reliable.

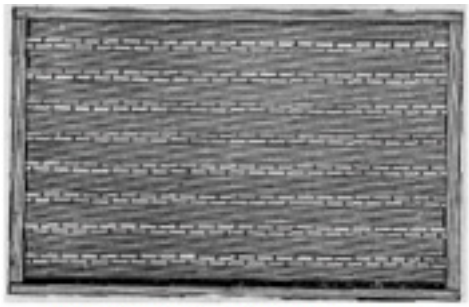
From 1885 to 1897, the A.I. Root Company catalogs listed honey boards for sale. However what was called a honey board looks like what we call an excluder. The Honey Boards were made for eight-frame and 10 frame hives and with or without borders. These boards were made of perforated zinc and the slots cut in the metal were large enough to allow a worker bee to pass through, but prevent the queen and drones travel.



HONEY BOARDS
Available in 8 frame and 10 frame boxes

Perforated zinc sheets and strips were available for a beekeeper to make entrance guards, entrance traps, and honey boards. There were two types of perforated zinc, one that had rectangular holes, called Root Zinc and one that had rounded rectangular holes called Tinker Zinc. In 1900, a honey board was made that had two rows of Tinker Zinc separated by rows of wood slats. This honey board was advertised as the most satisfactory honey board. By 1903, all of the perforated zinc sold by the Root Company was Tinker Zinc, and then it was called Root-Tinker Zinc.

Root Zinc Tinker Zinc



1900 - Most Satisfactory Honey Board

A process was developed October 8, 1907, to put straight wires in a mold and cast cross pieces to form excluder sheets called Chrysler Wire excluder material. However, some of the sheets were cut into three and seven wire strips to make honey boards. One of the first ones offered for sale in 1909 was the three wire honey board. It had three wires, but only two spaces were available for the bees to use between each slat.

Wire Queen Excluder Honey Board

close up of the three wires

In 1915, the A.I. Root Company came out with the seven wire excluder. It featured more excluder material in between the strips of wood and the name excluder was used rather than

Seven Wire Excluder

honey board. Some people will call this a five wire excluder as there were five wires visible in between the wood strips. The 1st and 7th wires were fitted in grooves in the wood strips. A controversy started as to which excluder was best and the consensus was that beekeepers preferred the three wire excluders as there was more area for the bees to walk and the excluder was much more rigid when you were trying to break it loose from the burr comb.

In 1917, two styles of the bee escape board were introduced. They were like an inner cover with a wood rim, a center board and screen or more wood to fill in the rest of the field. In the center board, a porter bee escape was set in an oblong hole. The porter bee escape was invented by W.L. Porter of Wisconsin and is a device that allows the bees to travel in a single direction. The original escape had only set of exit springs where the current ones have two sets of springs. Some beekeepers do not know that they must check the springs in the bee escape to make sure that it is operating correctly. Slide the pieces of the bee escape apart and see if the gap between the springs is about the width of a wooden pencil. Bend the springs until that distance is obtained and then reassemble the bee escape.

Bee Escape with Board

Hodgson Ventilated Escape Board

Porter Bee-Escape

In 1924, the inner cover that had been offered since 1917 with a plain outer rim was now offered with a semi-circular cut in the rim to allow for ventilation through the hive. When you bought the inner cover new from the dealer, a semi-circular wood block came with the cover if you wanted to make the outer rim solid.

In 1927, there was a change in nomenclature and the inner cover was the board that went on top of the hive and the bee escape board was the board that was below the honey supers. The bee escape board had screen to give the bees and hive the ventilation that they needed. The inner cover continued to have wood in the entire field of the top.

The current bee escape boards do not fit into the commonality of terms as they were developed well after the time of the early bee escape boards. However I will mention their names to clarify them so they won't be grouped with the rest: Down and Out Boards, Conical Bee Escape Boards, and Triangular and Diamond shaped Canadian Bee Escape boards. The purpose of these boards is to remove bees from the honey supers so the honey can be harvested.

By 1929, the zinc bound excluders had been discontinued, but you could still get the plain zinc sheets in the eight-frame and 10-frame sizes and the bulk sheet.

In the 1920s an inner cover was used by some beekeepers to block the movement of the queen. The inner cover had a solid wood rim and a solid center, however along both sides there were five 3/8" holes drilled about 1" from the inside edge. The beekeeper could use this form of an inner cover as an inner cover or move it down under the honey supers and use it as an excluder. For positive ventilation, sticks could be placed between the super and the inner cover when it was at the top of the hive.

A Root Queen Excluder Test Gauge was first available in 1938. This was a tapered pin with two small groves. When the gauge was inserted between the wires of the excluder, it should go past the first mark but not past the second.

The 10-frame one piece wood bound wire excluder was finally available from the Root Company in 1958. An unusual thing about the one piece excluder was that it was stenciled which side should be placed up and that was to try to keep bee space correct. When you looked at the excluder, both sides looked similar. The only difference was that the cross bracing was more prominent on one side.

What does an excluder actually do? Excluders are used to keep Queens and Drones out of the honey supers and keep them in the brood nest. Sometimes the queen is kept in a certain area for queen rearing purposes. Because the space allowed for bees to pass through an excluder is small, worker bees prefer to store nectar below the excluder which may reduce the queen's egg laying space. Thus the beekeeper needs to be aware if frames should be moved around into the honey supers, and additional frames of empty comb for the queen to lay eggs in are needed. Failure to keep adequate room for the queen may result in swarming. If you are producing comb honey or putting many supers on a hive all at once, you may want to use an excluder.

Other forms of excluders could include: an all plastic sheet of excluder material, a wire excluder with a metal border, a 1/8" piece of plywood, a modified inner cover, and a honey super.

When you use an excluder that has no border, there is a good chance that you will violate the bee space rule and thus the bees will attach the excluder to the frames. When trying to remove the excluder, you may bend it out of shape, spread the wires, and kill bees. The plastic excluder has the advantage over the metal ones in retaining its shape, however if the weather is cold enough or the excluder is old, it may break when you are prying it off. The metal bound excluders give you more rigidity, but they still could have an issue of violating bee space. You will also develop a routine in keeping your excluder in the same orientation. A mistake could let the queen and drones be released on the wrong side of the excluder.

If the beekeeper operates the hive so the brood area is maintained in the center portion of the hive, the use of a piece of 1/8" plywood will act as an excluder. A piece of plywood is cut so that it has a 2" border gap from each side of the hive and laid on the frames over the brood nest. That would be a board that is approximately 10¾" x 14-3/8". The board would keep the queen down while the workers would have access to the upper supers by going up the sides. It works most of the time, but there is still a chance that the queen can find the free passage way.

My favorite "excluder" is a super of honey. To explain why and how

it works, I need to remind you of the activities that bees do each fall. When the bees are getting ready for Winter, they will fill the recently hatched cells in the upper stories of the hive with nectar so the queen cannot lay eggs in them. Essentially the workers are forcing the queen to move down into the lower super. By the same method, the queen is kept in the brood area when a band of nectar or honey is above the brood. The queen generally does not cross honey, so if I put on a super of honey on top of the brood area, I may put empty combs on top of it and the bees will store honey in them. The only time that I have had a queen lay in the honey supers is when there has been a hole in the super and a swarm moved into the hive above the full honey super. It used to be that the full honey super could be left on the hive during the Winter as it would be your insurance that the bees would have enough food. In the Spring, the super could be removed and the honey harvested, if they didn't need it. However times have changed due to the mites and the medications. If you have been abiding with the rule that no medication is given to the bees when the honey supers are on you could still use the honey. BC

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1 - Yves LE CONTE and Didier CRAUSER - UMR 406 INRA/UAPV Invertebrate Ecology, Laboratory of Biology and protection of the bee, INRA Avignon, France - 2006.

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Where Will They Go?

Evaluate Your Potential Apiary Location

Larry **Connor**

Flower-pot bait hive provides a method of capturing swarms. Repasky photo.

Early on in your pre-beekeeping planning, you should carefully evaluate all your potential apiary locations. Evaluate location options with a mentor or another experienced beekeeper before locating bees in your back yard or friend's backyard, review these items, and address the suitability of each one. Use the number of colonies you want to start as one of the criteria you use to evaluate a site. I recommend all new beekeepers set up a minimum of two to four colonies, and a maximum of 20-24 colonies during your first season. The lower number fits into a sustainable concept where colonies help each other in a time of need, while the larger number will help you both optimize your time and investment but unfortunately will also increase your risk.

Hazards to Humans and Animals

No apiary should be established where there is a potential for doing harm to humans, animals or the bees themselves. First, some bee biology; when bees are young, they make orientation flights around the front of the entrance of the hive as a means of learning the location of the colony. There are often a large number of young bees that do this at the same time. Some beekeepers call this 'play flight'. All bees must make these orientation flights in order to successfully return to the hive, including young queens and drones. For some people, the sight of several hundred bees in the air in front of a hive can be unsettling. These bees are no more likely to sting than bees on normal flight, and maybe less so, since these are young bees. Beekeepers who have not seen this behavior will mistake it for swarming, which it is not. When non-beekeepers see this behavior, they might think that an attack is about to start. It is not, but how would an inexperienced human know that fact?

Most bee flight is part of foraging behavior. During normal food gathering by foragers, they fly out of the hive and head directly to the food source, as instructed by the dance language bees use to communicate. This may take the bees right over a sidewalk, the neighbor's lawn or garden, or into a pet area. A tall row of trees will force the bees to fly up and over the people and pets, as will a building or fence. In an open suburban lot, open space will be filled with foragers flying out of and back to the colony. A simple fence, fast-growing hedge or even a barrier made of burlap strung between fence posts will direct flight up and out of the way.

While you may think it looks pretty to have your hive at the edge of your vegetable garden, some of the bees will return to the hive by flying over the garden where you are working, get tangled in your hair and cause an accidental sting. This is not the same as the bees foraging on your cucumber flowers or working the borage; those bees will rarely cause you any problems and you probably will not notice they are there. In selecting an apiary location, carefully consider others who will be working and playing in the area, especially children, those with limited mobility, and animals in confinement.

Sun Exposure

The entrances of natural colonies in bee trees usually face south and southeast in the wild. Bee colonies seem

Providing an attractive water feature that also provides water for honey bees will eliminate problems with neighbors and their swimming pools, as well as minimize exposure to pesticide residues.

to do best with this orientation, carefully selecting cavity spaces with their entrance in the morning and midday sun. Full sun locations have several advantages – warm, dry colonies discourage two parasites, the small hive beetle (*Aethina tumida*) and the *Varroa* mite (*Varroa destructor*). Honey bees are of tropical origin and apparently handle heat better than either pest species. These pests reproduce poorly under hot and dry conditions, so placing bees in a full sun location is a simple adjustment you might make to reduce their predation. Since this heats the bees as well, supply them water with a dripping hose, a water feature filled with tropical plants or a jar filled with water in an entrance (Boardman) feeder.

How Many Colonies?

Your community may set a limit on the number of colonies you can keep on the property you own, based on lot size and other rules. Let's say your city guidelines limits you to four colonies. You can manipulate that number a bit by using double nucleus hives (two queens that are side-by side in divided boxes on one hive stand). Or you may have mating nuclei that are not as strong and powerful as full-sized colonies. You might make up nuclei during the late Spring and Summer and sell them or move them to an out yard for final development. That will keep you colony count within the spirit of the guidelines.

If you have an apiary location in the country, your primary limiting factor will be the amount of forage for the bees throughout the season. Some locations may be very good for Spring buildup and an early nectar flow, but then become a food desert that causes the bees to consume their stored food as well as steal food from each other. Other locations may have productive nectar production for a few weeks every year, and then become and area where it is relatively difficult to keep bees. In a heavily forested region of New England I have seen apiaries with as few as four hives – any more than that will not increase total honey production. In areas of diverse forage and generally good beekeeping locations, I find that yards between 12 to 30 colonies are possible.

Well protected beekeeper working applying smoke in an apiary. Repasky photo.

As you expand into a new yard location, start with a smaller number of colonies and, over time, build the holdings as experience shows that the site can support more bee colonies. There are sweet clover locations in the Midwest that can handle 30 or more colonies quite well but only during the clover flow.

Locations may be very good for Summer nectar collection but not at all suitable for wintering. You want to avoid locations with extreme wind exposure, risk of vandalism from hunters and snow machine users, or are nearly impossible to visit and feed during January and February. You will want to visit the colonies during the Winter to evaluate their weight for remaining honey and feed as necessary. If you have deep snow you may end up using snowshoes and a sled filled with winter sugar patties to put on the bees to prevent starvation.

Some clever beekeepers put a group of bee colonies on a trailer that they can move to pollination sites and honey production areas. At the end of the season the bees are returned to a permanent apiary where the colonies are placed on the ground, fed, protected for Winter, and watched carefully.

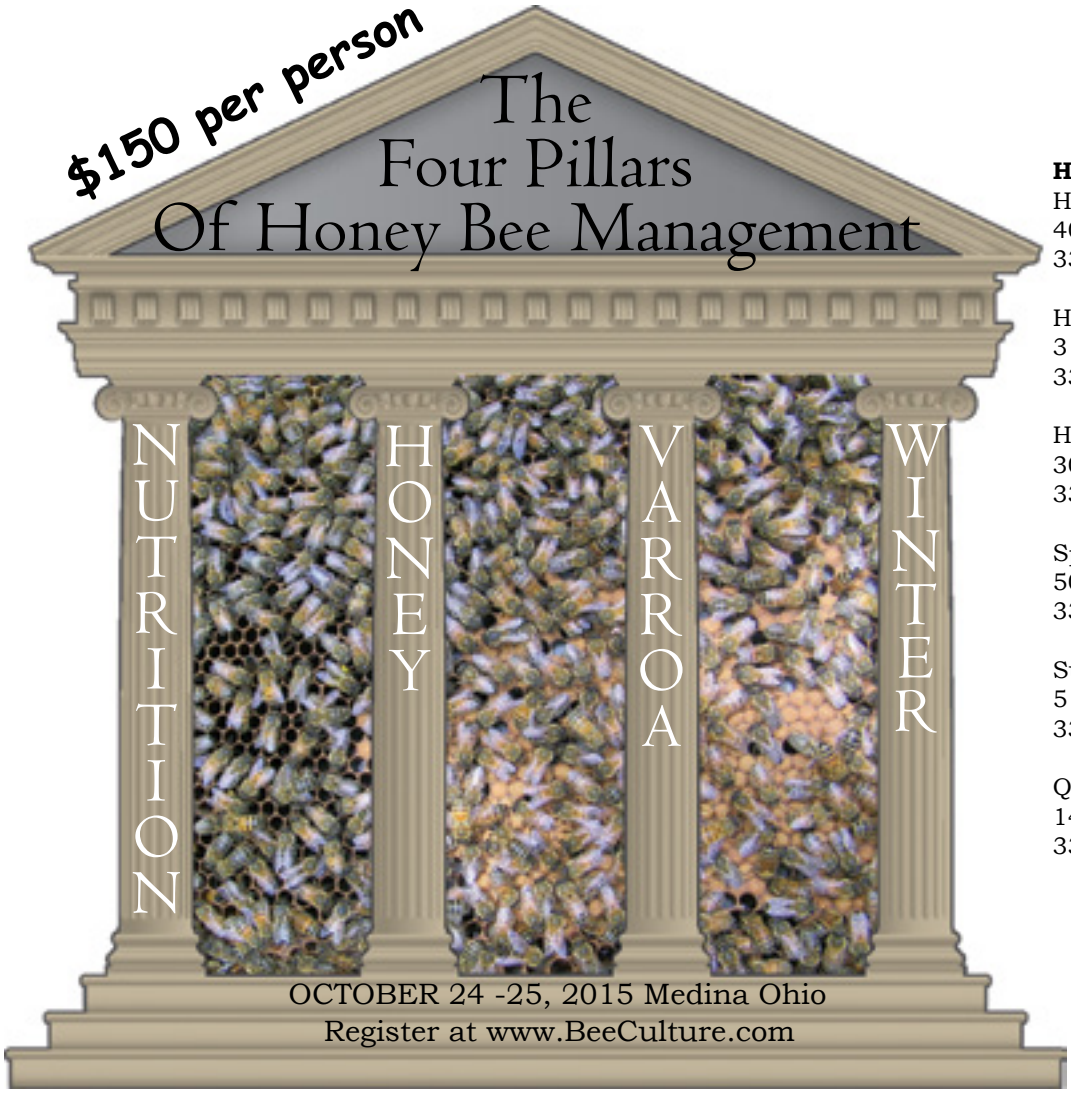
Bee Forage

Honey bees do not visit every flower species Nature produces. They rarely visit tomato and related flowers because they do not buzz pollinate the flower like bumble bees to obtain pollen. It confuses new beekeepers to see vast expanses of flowers in full bloom and not find a single honey bee visiting them. Sometimes the flowers are covered with pollinating fly species, and other times there may be a predominant species of native bee on the flowers. This is where a good teacher/mentor will be a great help to the new beekeeper, as will selected reference books.

There are an estimated 20,000 species of bees in the world, and the honey bee is only one of them. Different races of honey bees that have evolved to pollinate plant species found within their native habitat. For example, studies in Europe showed that Italian bees (Apis mellifera ligustica) were more attracted to citrus flowers than bees that had no selective time together with Citrus. Similar differences in daily flight time were found between different races of bees in the African desert. It if sounds confusing, it is, and there are many specialists who have spent their entire careers trying to unravel this complicated puzzle. There is much more to learn about bees and flowers, a field called Bee Botany. In the United States, these races have been interbred to such an extent that it is hard to discriminate traits.

For the sustainable beekeeper, knowledge of the plant species and even varieties or cultivars of certain plants will be extremely valuable. Since the honey bee is not native to the Americas, it has a competitive relationship with other pollinators. Generally, this competition makes both the honey bee and other bee species work harder to collect pollen and nectar, which is beneficial to the plant needing bee visits for pollination.

Many agricultural and garden flowers are also introduced to the Americas. Some, like apples are widely embraced by human culture while others, like spotted knapweed (Centaurea spp) and purple loosestrife (Lythrum salicaria), are highly regulated in some areas and subjected to biological control agents introduced for their control. Since honey bees are generalists –



Hotels In The Area –
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

Join *Bee Culture* Magazine's Exploration of the Four Pillars of Honey Bee Management in October, 2015 at the *Bee Culture* Conference Center (on the A.I. Root Co. campus), 640 West Liberty Street, Medina, Ohio.

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

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

Next, listen in as **John Miller, Andy Card** and **Steve Coy** who are in the business of serious honey production share their secrets, their skills and even their mistakes so that they consistently make as much honey as their bees can, every year. And now so will you.

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

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

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

visiting a wide range of species – they benefit this floral smorgasbord as pollinators while benefiting themselves while filling their hives with surplus honey and pollen.

In a future article we will discuss the pollen and nectar producing plants important to bees and beekeeping, and the general colony management plans for the area. We know that not all pollen sources are the same, and here is a simple summary:

Nutritious – A mix of nutritionally adequate pollens are needed for the production of bees with strong, healthy, food reserves. They are often called Winter or Fat bees.	Deciduous fruit trees, lupine (in Australia), almond, clovers, pear, some Eucalyptus trees, buttercups, Crocus, willows, wild radish, prune, apple, mustard, rape (canola), and poppies.
Less nutritious	Elm, cottonwood, ash, dandelion, sweet corn.
Least nutritious	Many air-borne pollens such as alder, hazel nut, ash, birch, poplar, field corn. Sunflower, eastern buckwheat, fireweed, blueberry, and weeping willow have lower nutrition and bees will discard the pollen.
Especially poor	Pine, spruce, fir, and cedars

Foraging Distance From Hive

It is beneficial to honey bee colonies to be situated near a major nectar source because it costs the hive less energy, in terms of honey, to launch tens of thousands of worker bees to a nearby location than a distant location. In diverse forage environments honey bee workers fly routinely two to three miles to obtain pollen and nectar. This is an efficient foraging distance where the cost of flying the forager to the flowers still pays back with a positive nectar/pollen load. As distances increase, the flight becomes more costly for the colony. One California research study showed that honey bee foragers flew four miles for a very rich nectar source, passing over poorer nectar sources just two miles away. In the U.K. 10 percent of the bees on heather flew nearly six miles for forage and the average bee flew 3.4 miles. Reports of bees flying ten or 15 miles to forage may be an exaggeration or a reflection of a complete lack of food of any energy composition.

As you evaluate a potential apiary location, use an Internet map image or a traditional printed township map to draw circles around potential apiary sites. Draw circles with a radius of two miles, one at three miles and another at four miles. The two mile radius should be used to determine where rich sources of food are available. The four mile radius should be reviewed for potential problems with chemical exposure, diseased colonies or any potential hive disaster. It can be pretty shocking to see the wide range of risks bees face with their wide foraging range.

Water supplies should be within half a mile of hives, and preferable within the apiary. As temperatures increase, the percentage of bees collecting water increases. At extreme temperatures (above 105°F) the colony is primarily seeking water. Use a water feature using tropical plants to establish an attractive water source you can enjoy as well, especially in your backyard.

Flood and Fire Risk

Many potential apiary locations run the risk of high water during spring flooding during snow melt and seasonal flooding. During dry periods the risk of high water in a particular location may not seem to be great, but in areas where droughts have been routine for a number of years, during which beekeepers have set up and run bees for several seasons, a return to normal moisture level will increase the chance of flooding from a local stream or lake. Moderate flooding with the bottom boards covered with water can be tolerated if the bees have a good upper entrance. But where water rushes through and carries hives down the river, these locations must be avoided at all costs.

During extremes in dry weather, there is always the risk of a forest or grass fire. Keep bees out of extremely high risk areas and put bees in less risky locations, such as in the middle of a fire lane or vegetation free region to reduce the risk of fire. Even suburban small-scale beekeepers loose colonies when a trash burn gets out of hand and burns their colonies.

Pesticide Exposure

As we learn more and more about bee deaths, outright or indirect, we learn that there are many compounds being used in the environment that negatively impact the colony. When setting up your apiary, check for use of routine chemicals in agricultural crops, around golf courses and corporate headquarters where all sorts of pesticides are used in great abundance. Even the water coming off the lawn may be toxic to bees searching for fresh water. BC

I'll Bee In Albion! Join us at the 150th anniversary of the Michigan Beekeepers Association and the Heartland Apicultural Society in July.

Create A MASTER BEEKEEPER PROGRAM

Ann **Harman**

Beekeepers in your area have been asking for a Master Beekeeper program. They wish to have some goals to achieve and also ways to improve their knowledge of honey bees and beekeeping. Perhaps now is a good time to start planning the program. Where to start?

A number of states have made their own Master Beekeeper program. These all have similarities and differences. Some Master Beekeepers programs are large and elaborate; others are simple. The Eastern Apicultural Society (EAS) has had one for many years as has the U.K. These two have different approaches to preparation for exams and the exams themselves.

It will be worth the time to see what your surrounding states are doing. All the state associations have websites with information but in some cases it may not be easy to navigate around the site to obtain what you need. Not all states have a Master Beekeeper program but new ones are appearing. A good program takes time and dedication to construct it and to run it successfully. Some states have a contact person in charge of their Master Beekeeper program. Take the time to find out how successful a program is as well as the details of its operation. The more information you can gather the better prepared you will be to structure your own. Yes, the amount of information could be overwhelming. Perhaps this is the time to have a committee – a small one! (This is what a famous inventor said: 'If you want to kill any idea in the world, get a committee working on it.' Charles F. Kettering) You might ask your club members if anyone has taken a Master Beekeeper exam. Even if that member does not wish to be on the committee, any suggestions or information would be valuable.

Any type of continuing education or recertification must be made an initial part of any Master Beekeeper program even if it will not be put into use for several years.

Think about the purpose of your Master Beekeeper exam. Is it just to satisfy someone who wants that title? Is it to help the members of your club to become better beekeepers? Is it to encourage your club's Master Beekeepers to engage in public service, bringing correct and good information to the general public? The Eastern Apicultural Society's initial purpose was to identify knowledgeable beekeepers who would help educate beekeepers and the non-beekeeping public about honey bees.

As you look through the information from other states you will see that some are just exams while others require outreach. In today's times the general public is being overwhelmed with information about pollinators. The Internet, newspapers, magazines, radio and television are crammed full of information and opinions. Give some thought to the fact that your beekeepers could give sensible presentations to non-beekeeping groups as

- Part of the Master's Program should involve public outreach, such as teaching a class to children.

Should being able to identify local honey plants be part of the exam?

well as to questioning individuals. Having some public outreach as part of your Master Beekeeper requirements is necessary in today's confusing times.

Many beekeepers hoping to become Master Beekeepers seem to think the way to become one is to take a class designed for taking the exam then take the exam and pass it. In the planning of your club's Master Beekeeper program it may be important to reinforce that beekeeping is both a craft and a science. One person may be able to read a book and pass an exam but not be a capable beekeeper out in the beeyard. Another beekeeper in an ideal bee area may be successful in keeping colonies functioning and healthy but not know about the roles of pheromones in the colony. A Master beekeeper should have comprehensive knowledge –theoretical and practical.

Will your program have three levels, or four, or five, each with a written exam, a field exam and perhaps other exams, requirements or activities? Remember, each level will have to have exams designed and administered, graded and possibly discussed with the beekeeper who may have a complaint. Does your club have the ability not only to initiate the program but also to continue it? You see, if the club's Master Beekeeper program manages to exist for three years and then falters, it may seem to have lost its meaning for those who passed a level or two. Look into the future.

While you are doing the initial planning remember that the Field Exam may be the most difficult one to organize. You will need to think about whose hives will be used. Where and when will the written and lab parts of the exam be given? Your state beekeepers meeting could be an ideal place even for a field exam. Hives that have been brought for demonstrations or workshops could be suitable for exams also.

Now how about time keeping bees, meaning requirements of how many years keeping bees to take the first level, years keeping bees between levels. Depending on the requirements for each level, it may be impossible to fulfill them with one year between. There is nothing wrong with that impossibility! The goal is not to have a beekeeper race through the exams as fast as possible but to end up being an educated and competent beekeeper.

As your committee is making plans for the program, keep in mind any costs. Many states do charge for the exams but exactly what that money is for is not always clear. You may need money for printing, postage, certificates and the famous 'miscellaneous.' You must be ready to explain to anyone exactly what the charges are for so that they seem reasonable.

Names for your chosen levels should make sense. They could be numbered – First Level, Second Level, etc. However you will not find other states using such prosaic terms. The names come from history, like Apprentice, Journey, Master and Master Craftsman.

For creating the exams you could start with a list of general topics, such as diseases, pests, swarming, queens, etc. These general sections could generate questions on different levels of difficulty and different ones each year.

The Eastern Apicultural Society and a few other states have an oral exam along with the written ones. Some states require giving a presentation to a beekeeping club or to another audience. Writing a column for a beekeeping newsletter or magazine can be part of the outreach.

EAS does not offer a study program for its exams but does provide copies of past exams as well as an extensive book list. Information can be found at **www.easternapiculture.org** at the Master Beekeeper tab.

The exams given in the U.K. are formed into modules. Books are available as guides for each level as well as for the special optional exams such as Microscopy. Information on this program can be seen on the following website: **www.bbka.org.uk/learn/examinations_assessments**

Your beekeepers will ask what books they should study for the exams. If your club has a library for its members, then those books would be available. A book list can be created with an assortment of books including such specialties as beeswax. Once the program is underway copies of past exams can be offered as study guides.

Your club has a mixture of those who have kept bees for years, read all the magazines, visit schools with their observation hives and those who have kept bees for five years and occasionally come to a club meeting. Both of them want to enter the club's Master Beekeeper program. You will need to establish some guidelines, especially for the very experienced beekeeper. Should this beekeeper be required to take all the exams starting at the lowest level or enter the program at a higher level? The five-year beekeeper probably would need to start at the lowest level.

Although many beekeepers would like to pass all the exams needed for the highest level and consider becoming a Master Beekeeper finished when handed the certificate, give serious thought to some form of continuing education or retesting to give some type of renewal of that certificate. Beekeeping is changing rapidly these days. New pests and diseases will appear; new treatments and forms of nutrition will also appear. We do not know what the future of pesticides will be. African bees continue to invade new areas. Since Master Beekeepers should be able to give correct up-to-date information to beekeepers and the public, unless they keep in touch with current events their information will be stuck in the Beekeeping Dark Ages.

Any type of continuing education or recertification must be made an initial part of any Master Beekeeper program even if it will not be put into use for several years. The beekeepers deserve to know at the beginning what is expected. Yes, such recertification will mean more record keeping but with our cheerful computers keeping track of dates and people that task is not overly cumbersome.

A beekeeping club that incorporates some type of recertification does benefit from its Master Beekeepers. They are the ones who can keep members current, therefore all becoming better beekeepers.

Start planning your club's Master Beekeeping program now. Don't rush it. Correspond with contacts in other clubs with such a program. Make some initial plans then set them aside for a short while. When you return with 'fresh eyes' you may make some changes. When you do initiate your program be willing to listen to those who participated. Be willing to change something that just did not work for the majority. Will everyone pass all the exams? Probably not but the exams gave them something to improve, thus become a better beekeeper. BC

Ann Harman has been involved in several Master Beekeeper Programs over the years. She keeps her bees at her home in Flint Hill, Virginia.

Introducing Her Royal Highness

Ross **Conrad**

There are at least two instances where a beekeeper may need to introduce a new queen to a colony. When a colony has been split and a queen is being introduced into the split or nucleus colony rather than let the colony raise a queen on their own from eggs or queen cells, or the hive may have become queenless for one reason or another and a new queen is being introduced into the colony before the workers, in the absence of a queen and developing brood, begin to lay the unfertilized eggs that will turn into drones. (I am not going to go into why I believe that for most beekeepers, the act of re-queening by purposely killing a hive's current queen and replacing her is foolhardy. However if you're curious you can peruse my article "To Requeen, or Not" in the December 2009 issue of *Bee Culture*).

Older worker bees will reject queens that they are not familiar with and tend to view them as a colony invader, even when they have no hope of raising a new queen on their own. This is especially true if the queen is unmated, or not well-mated, with numerous drones from unrelated colonies. This is why queen rejection by a colony will occur if the queen is released from her cage too soon.

Commercial Queen Cages

I generally like to begin the introduction of a queen to a colony as soon as possible, but sometimes weather or other circumstances will delay the start of the queen introduction process. For each day that a caged queen is unable to be introduced into a hive, it is a good idea to place a drop or two of clean water on the screen of the cage, so that the workers in the cage with the queen can use it to help dissolve the fondant candy and utilize it for food. The caged queen should be kept at room temperature, away from breezes and out of the sun until you are ready to introduce her to a hive.

The traditional approach has been to remove the cork from the end of the queen cage where the fondant is blocking the hole. The queen cage is then placed in the hive between a couple frames in the brood nest with the screened side of the cage facing down. The brood nest is the preferable location for the cage as it helps to ensure that the caged queen will be kept warm within the bees clustering around the brood area.

When introducing a queen into a colony housed in a hive body full of frames, the cage will have to be pressed into the comb of the adjacent frames unless a frame is removed in order to make room for the queen cage to fit between two top bars. After a few days, if the bees have not chewed through the candy and released the queen, she should be manually released by the beekeeper provided the bees are not clinging tightly to the cage. If the bees are still clinging tightly to the cage, this is an indication that more time is needed, or some other approach is required before the bees will become accustomed to the new queen.

Manually releasing the queen used to be done routinely after three days or so, but more and more, beekeepers are waiting five days or more. Each beekeeper will have to find their own balance between allowing plenty of time for the workers to accept the new queen and not waiting so long that the hive is significantly set back from a lack of new brood being raised or possible additional stress on the queen from an overextended confinement period. All queen introductions tend to work best when the hive does not contain any queen cells and is left queenless for at least a day or so before a new queen is introduced in a cage.

If the queen needs to be manually released after several days, be sure to closely observe the reaction of the workers in the hive to the newly released queen, even if the workers didn't appear to be clinging tightly to the cage and are easily brushed away prior to the release.

If the workers appear to act aggressively toward her, then the queen needs to be put back into the cage for a few more days. Although one should always be gentle and calm when working with bees, this

A standard commercial queen cage installed in a hive body and wedged between the top bars of the frames."

The Art And Etiquette Of Queen Introductions

is especially true when working with and handling queens.

Personally, I will only pick up a queen by her wing in order to reduce the chance of accidentally hurting or damaging the queen. A newly released queen that becomes excited and races across the combs will draw additional attention to herself. When necessary, one of the following measures can be used to help overcome worker rejection and speed up the queen acceptance process.

Push-in cage

A push-in cage is a queen introduction approach favored by many beekeepers because it allows the queen to start laying eggs immediately and it allows a larger surface area for the bees to have greater access to the queen's pheromones. However this method requires handling the queen, which some people may not be comfortable doing.

The push-in cage can easily be made from a piece of 1/8th inch hardware cloth with cuts about ½-¾ of an inch from the corners and the edges of the hardware cloth bent so the screen is folded over itself at the corners. This creates the side walls of the cage that are about ½-¾ of an inch tall.

The cage is placed over an area of comb that contains emerging brood. The bees are brushed or shaken off the comb first and push-in cage is placed over an area of empty cells, a few emerging brood cells and open nectar.

The queen from the candy cage is placed under this cage, sometimes with the attendant workers that come in the original queen cage, and sometimes without. It is important not to allow any adult bees from the hive to get under the cage with the queen. The cage is gently pushed into the comb about a quarter of an inch (but not past the mid-rib of foundation) allowing the queen to move freely underneath. As with the regular queen cage, the push-in cage can usually be removed to release the queen manually after a few days, or once the bees are no longer clinging to the cage and are easily brushed away.

Sometimes the bees will release the queen by excavating the wax under the wall of a portion of the cage. If the bees have not released the queen and are clinging tightly to the cage it means they have not accepted her yet, and more time is needed before the cage should be removed.

Bermuda Queen Cage

An alternative to the push-in queen cage that does not require the handling of the queen is the Bermuda cage. This cage was designed and built by a very thoughtful and creative beekeeper named Albert Swan, who I met during my recent trip to Bermuda (see *Bee Culture* June 2015). The Bermuda Cage allows the workers in the hive an extremely large surface area in order to increase exposure to the queen's scent. The cork is removed from the non-candy end of a wooden commercial queen cage, and the cage is placed into an opening in the Bermuda Cage that holds it snuggly in place. The Bermuda Cage then fits snuggly into a shallow frame, and a deep frame in the brood box is replaced with the shallow frame containing the Bermuda Queen Cage.

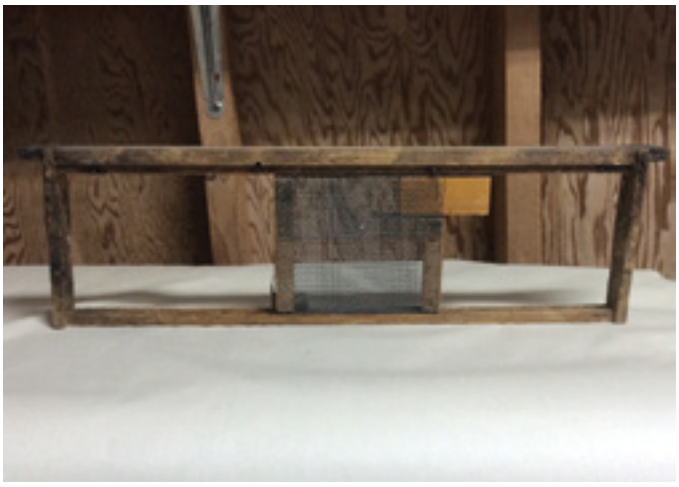
The Bermuda Queen Cage allows the beekeeper to expose the queen to a much larger population of workers in the hive during introduction that is possible when only the standard commercial queen cage is used. Photo by Tommy Sinclair

The Bermuda cage includes a hole that can be filled with fondant candy, although this is not absolutely necessary if there is candy in the exposed hole of the commercial queen cage. However, this opening can be used as a second escape route for the queen should she not return to the commercial queen cage in order to exit the Bermuda cage. Once the queen is released, the shallow frame is removed and replaced with a regular deep frame.

The Bermuda cage is only five inches long and 4½ inches tall as Mr. Swan did not want to make the cage so long that the queen might become confused and not easily find her way out of the cage once the candy in one or both of the openings was chewed away. Mr. Swan reports almost 100% success introducing queens using a Bermuda cage this size.

Successful queen introduction was extremely important to him since queens have never been commercially raised in Bermuda and the only queens obtainable on the island in recent history were shipped at great

A queen and numerous attendants contained under a push-in cage installed on a frame of comb.



The Bermuda Queen Cage with a standard Commercial Queen Cage installed in a shallow frame and ready to be introduced to a hive. Albert Swan photo

expense from Hawaii. Unfortunately, queen shipments were discontinued once varroa mites were found on the Hawaiian Islands in 2007 and Mr. Swan has not had the occasion to use his queen cages to introduce new queens into his hives since.

Essential Oil Queen Introductions

Sometimes, even after many days of being exposed to a queen in a cage, worker bees will still treat the new queen aggressively. One trick that can work for getting a group of workers to accept a new queen is to lightly spray emulsified essential oils mixed with sugar syrup all over the frames and the bees in the hive, immediately before releasing the queen (the queen is not sprayed). I have done this on several occasions when workers continue to act aggressively toward a queen even after the caged queen had been in the hive for about a week, and it has worked every time – so far. However, I feel that I need to try this queen introduction method several dozen more times before I will suggest that it works almost all the time.

The essential oil mixture I use for successful queen introductions is a combination of lemongrass and spearmint oils. There are at least three products on the market that contain these essential oils, any of which could be used for queen introduction: *Honey-B-Healthy* available from numerous independent distributors, *Pro Health* distributed by Mann Lake Beekeeping supply in Minnesota, and *Essential-B* distributed by Jester Bee Co., in Florida.

It appears that by spraying each frame of bees in a hive immediately before releasing a new queen, the scent of the essential oils along with the sugar in the spray that the workers start cleaning up, both act to distract the bees in the hive long enough that the released queen has time to both spread her pheromones around the hive and start laying eggs so that once the mess created by the essential oil infused sugar syrup is cleaned up, the queen has seamlessly integrated herself into the colony.

No matter what approach is used to introduce her highness to her royal subjects, one does not have to find the queen days later in order to confirm that a newly introduced queen has been accepted into the colony; the presence of properly laid eggs is enough to confirm that the colony is now queenright. BC

Ross Conrad is the author of Natural Beekeeping: Organic Approaches To Modern Apiculture, *Revised and Expanded 2nd Edition*

Got A Question?

Ask Phil

Phil **Craft**

He Knows!

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

A beekeeper in Indiana writes:

This past Spring I slipped across the Indiana border and heard you speak at a beekeeping school in Ohio. I attended both of your talks, enjoyed them very much, and I learned a lot. During your talk on reducing colony loss, you emphasized controlling *Varroa mites. I realize that I am one of those beekeepers who lose way to many hives each year. This Winter I lost half of six, and this was a better year. I'm getting tired of buying new packages each Spring, and my wife is paying more attention to the checks I write. During your talk you briefly discussed monitoring for Varroa, and threshold numbers. Could you give me recommendations on the best monitoring method to use, and as you said "the numbers please'?*

Phil replies:

I commend you for wanting to learn more about the monitoring and control of *Varroa* mites. When I was the Kentucky State Apiarist, each spring brought nice weather, nectar in my honey supers, swarms in the trees, and calls from beekeepers asking why their bees had died. Now that I'm retired from the state, I no longer get the phone calls, but the same question comes up at beekeeping meetings and in my email.

In attempting to diagnose the problem, I use a standard series of questions. First, "What did you do last year to control varroa mites?" Most of the time the answer is, "Nothing, I don't have a mite problem." Next I ask, "What monitoring method did you use to determine that?" I usually don't get to my third question, regarding the results of the monitoring, because beekeepers who sustain heavy losses typically have not monitored at all. They formed their opinion based on the fact that they did not see many mites on the adult bees in their hives. Other bee inspectors and apiculture extension specialists I talk to tell me that they ask the same questions and, far too often, get these same responses.

I considered, and still consider, this indifference towards monitoring and treatment of *Varroa* mites self-defeating if beekeepers hope to keep their colonies alive.

There is no doubt that *Varroa* mites are the most important factor in colony loss. I have more than once heard a beekeeping researcher say that if we could magically make *Varroa* go away, colony losses would drop dramatically.

I spend a lot of time these days talking to commercial beekeepers, and invariably find that they work hard to control *Varroa.* Ironically, recent surveys show that over 60% of small scale beekeepers do not treat or even recognize when they have a mite problem.

In the early 1990s, our only tool for fighting *Varroa* mites was the application of a very limited number of chemical control products through a method that we called "treating by the calendar." Taking for granted (usually correctly) that they had a *Varroa* problem, beekeepers applied a chemical miticide in the early Spring, and again in the late Summer or early Fall. The problem with the routine, repeated application of a limited number of miticides was that *Varroa* quickly became resistant, initially to fluvalinate (brand name Apistan), the first effective chemical product labeled for control of *Varroa,* and then to coumaphos, the active ingredient in CheckMite+.

In the meantime, researchers were devising procedures

to count mites in a scientific sample of bees in order to give beekeepers a quantifiable standard to use in determining when an infestation represented a low level threat versus one severe enough to require treatment. The idea was to extend the period of time between treatments, and to limit applications to those which were truly necessary, all in an attempt to retard the development of resistance.

Systematic procedures are necessary because assessing the level of a *Varroa* infestation is just not as simple as pulling a frame of bees and counting mites. First of all, it's one thing to identify tiny mites on an enlarged photo of a bee in a book or power point slide; it's quite another in a roiling mass of bees in a living colony. Also, most mites are not found on adult bees to begin with. During periods of intense brood rearing, as many as eighty percent of the *Varroa* in a hive are sealed inside brood cells, reproducing on bee pupae.

Today, there are three procedures commonly used to monitor for *Varroa* – alcohol washes, powdered sugar rolls, and sticky boards. The alcohol wash is considered the most effective, and is the method of choice of most inspectors, researchers, and commercial beekeepers. It is also the one I recommend. It is a destructive test, meaning that it involves killing the bees in the sample, therefore it's vital to locate your queen to make sure that she is not among the bees collected. It's also important to take a large enough sample – between 200 and 300 bees. One half cup contains about 300. Directions for conducting an alcohol wash:

- Shake bees from two brood frames into a bucket or pan, making sure that your queen is not among them.
- Scoop up 1/2 cup of bees and dump them into a jar – a wide month quart fruit jar works well - which contains enough alcohol to submerge all of the bees. Soapy water can also be used, but I prefer alcohol.
- Put a lid on the jar, and shake it for one to two minutes.
- Place a sieve over a small white plastic bucket, and pour the bees and alcohol into the sieve. The shaking dislodges the mites from the bees, and they end up with the alcohol in the bucket. Brown mites are clearly visible in a white bucket.
- Repeat the wash by moving the dead bees from the sieve to the jar, adding more alcohol, shaking, and dumping them into the sieve again. Some experts suggest repeating this step until no additional mites are seen in the alcohol under the sieve, but definitely do it at least one more time.
- Count the mites in the liquid, and the bees in the sieve.

Many beekeepers make use of the approximate equivalence 300 bees to ½ cup volume, but I suggest doing an actual count, at least the first couple of times that you conduct an alcohol wash, in order to get a feel for what that many bees looks like.

To convert the raw numbers into useful information, divide the number of mites by the number of bees and multiply by 100. For example, six mites out of a sample of 270 bees would be 6/127 = 0.022 and 0.022 x 100 = 2.2, which represents the number of mites per 100 bees.

That number is compared to a recommended threshold, the number at or over which intervention (meaning chemical treatment) is required lest the colony decline and eventually suffer high bee mortality.

Thresholds are not constants. In recent years, due to increased colony loss, they have become more conservative, meaning revised downward. They also change with the seasons. Spring to early Summer is a time of maximum brood production in honey bee colonies, and therefor an ideal time for the population of *Varroa* mites, which reproduce in brood cells, to increase rapidly.

Because *Varroa* can get out of hand so quickly at that time of year, a lower threshold is used in the Spring. The bottom line is that failure to monitor, and to control *Varroa* when threshold numbers are exceeded, means an increased likelihood of a dead colony later in the season. It's best to monitor twice a year, in Spring and Fall. The following are the thresholds I recommend using for an alcohol wash sample. They are consistent with the numbers suggested by researchers.

- Spring – treat if more than 1 mite per 100 bees
- Late Summer - early Fall – treat if more than four mites per 100

A powdered sugar roll is a monitoring method similar to an alcohol wash, in that mites dislodged from a sample of bees are counted to arrive at an estimate of the number of mites present per hundred bees. The difference is that the bees are rolled, not shaken, in a jar with powdered sugar instead of alcohol. Some beekeepers prefer this method because it is non-destructive, *i.e.* it does not kill the bees. However, this method is not quite as effective at dislodging *Varroa*, and gives less consistent results. Beekeepers conducting powdered sugar rolls should reduce the above thresholds by one. If you ask me, I can refer you to more detailed directions for conducting a powdered sugar roll.

In my "Ask Phil" column in the August 2013 issue of *Bee Culture*, I discussed monitoring with sticky boards. If you would like a copy of that question/answer, let me know. Sticky board monitoring exploits the fact that a few mites are continually falling from honey bees in the hive as a result of the bees' self-grooming. Some view this method as giving more accurate results since it collects mites from the entire hive instead of from a sample of a few hundred bees.

In brief, in a sticky board survey, a sheet of cardboard or rigid plastic coated with vegetable shortening or oil is inserted beneath the brood area of a hive, often under a screen bottom board. The fallen *Varroa* mites are trapped on the board and counted to determine how many accumulate during a 24 hour period. However, these results are difficult to interpret, since thresholds will vary with colony size, time of year, and geographic location of the hive. As a result, I suggest using one of the other monitoring methods.

The recommendations of beekeeping experts change over time in response to changing circumstances and new research. After the devastating losses from *Varroa* which began in the late 1980s, the advice was to treat, treat, treat as soon as a labeled product became available. Back then, treating by the calendar saved many colonies. When resistance began to develop, researchers feared that our sole weapons against *Varroa* were about to become ineffective. The message changed to treat only when necessary, and monitor to determine when it is necessary.

Considering the statistics about the number of beekeepers who neither monitor nor treat, perhaps that message has become garbled over time. Some seem to have interpreted "treat only when necessary" as "not necessary to treat." Perhaps monitoring seems like too

much work compared to the simpler alternatives of treating on a schedule or not bothering to treat at all. Perhaps beekeepers who have come to the craft in the last few decades aren't aware of the effect *Varroa* had when it first arrived on this continent and of how it earned its full name, *Varroa* destructor. Whatever the reason, every year, beekeepers all over the country lose colonies to mites and the viruses of which they are carriers, and they never know what hit them. They blame pesticides, or CCD, or habitat loss, and sometimes those really are causes, or at least significant factors. However, too, too often, the underlying cause is a lack of effective management which allows a mite infestation to overwhelm a colony or weaken it the point that it succumbs easily to other stressors. The most frustrating thing about these losses is that they don't have to happen. There are now several products available for fighting varroa to which there is, so far, no resistance.

When I'm invited to speak to beekeeping groups across the country, I provide them with a list of talks I have pre-prepared and sometimes I develop a presentation on a new topic at their request. Often I'm told that the members are tired of hearing about *Varroa* mites and want something different. The reason I continue to talk, and write, about *Varroa* is that so many people still don't seem to have gotten the word.

A beekeeper in Kentucky writes:

I enjoyed your column, and web pages! I have a question My bees have been swarming at an unusual rate this year even though I have added supers to give them space it hasn't stopped them. This got me to wondering if I made a device to go in the box opening that would exclude queens and keep her from leaving the hive. Then I could just put that on the opening when this swarming starts to happen and the bees would have to stay in the hive. Later it could be removed. What do you think?

Phil replies:

It might work for a while, but not for long. When a colony is in what I call swarm mode, they are following a powerful instinctive urge, and it is extremely difficult for a beekeeper to prevent them from doing so. A sure sign that a hive is preparing to swarm is the presence of numerous queen cells – typically over half a dozen – and more than 15 is not unusual.

Swarm cells can be distinguished from supersedure cells because they are normally built on the bottoms of frames, whereas supersedure cells are usually found higher up, closer to the middle of the frame. However, I don't worry so much about where the cells are located; I just notice the numbers. Fewer than five cells probably indicates that the bees are preparing to replace an old queen, or supersede, rather than swarm. By the time you notice numerous swarm cells in a hive, the colony is already well along in the swarm process.

I don't know any beekeepers who have tried making a device to exclude queens at the hive entrance, but the general idea of restricting access to the entrance in order to prevent the queen's leaving with a swarm is not novel. It is usually accomplished by placing a queen excluder under the bottom brood box. It sounds plausible – if the old queen can't leave, the swarm won't either. However, a determined queen might be able to squeeze through a queen excluder, and if she cannot, the swarm will depart anyway with the first of the (smaller) virgin queens to emerge.

Another swarm prevention strategy based on the same premise is clipping a queen's wings to keep her from flying with a swarm. Of course, that doesn't work either, for the same reason. However, using a queen excluder (regardless of where it's placed) to restrict the entrance is not only ineffective, but also potentially harmful. Every day drones, which are larger than workers, will attempt to fly, be caught in the queen excluder, and die, clogging the excluder as they do. If this happens to the extent that it inhibits ventilation in the hive, it can cause overheating.

It is almost impossible to prevent swarming all together, but there are some simple things we can to do to reduce it to some extent. One is to keep young queens in our hives. Colonies tend to swarm when the brood area becomes congested and overcrowding reduces the bees' ability to sense queen pheromone. Because young queens produce more pheromone than older ones, the effect will be less pronounced and the bees less quick to swarm.

The most effective preventative action that a beekeeper can take is making nucs in the early spring, prior to the production of swarm cells. This creates space in the brood nest, relieving congestion there. Moving empty comb from a brood box's perimeter to the center of the area where brood is being reared may also help. Adding honey supers is another way to create more space, especially when they include drawn comb directly over the brood area. When my hives are ready for supers, I put at least two with drawn comb on each hive, without a queen excluder. This allows the bees to extend the brood area into the supers if they feel a need to. If the queen wants to go into the supers and lay eggs there, that is fine with me. Normally, any brood that is produced in the supers will have emerged and those cells filled with honey before I'm ready to harvest. If not, I can always prevent further egg laying by placing a queen excluder under the supers a few weeks before I'm ready to take them off.

If a colony swarms despite your best efforts, it might still be possible to keep them in the beeyard by maintaining a bait hive there or (if you are monitoring closely) by capturing the clustered bees and re-hiving them before they take off. There are times, though, when you just can't contain Mother Nature. I'm reminded of Ian Malcolm's line in Jurrasic Park, "Life will find a way."

I think that many new beekeepers are overly concerned about swarming, and maybe it's the fault of us old-timers for talking so much about it. If there is a good nectar flow, and my hives are strong (both factors which trigger swarming), I can still make a good honey crop. If you regard the colony as a single social organism, swarming can be seen as the way that organism reproduces. It isn't meant to replace one colony with another, but to increase the number of colonies. Therefore, the process normally leaves the old colony with sufficient resources to rebound, rebuild the population, and still produce surplus honey.

As I write this on May 10, several of my hives have swarmed, yet I have at least two full supers on each hive, and the best of the nectar flow is yet to come. There is honey to be made after a swarm departs. BC

Build A five-frame Nuc Box

Rick **Andrews**

Building a nuc box is not much different than making the boxes for a standard Langstroth hive. It's really just a smaller version. It's also not a complicated project and I've tried to make the process as easy as possible for the DIY guy or gal with basic woodworking skills. Hence, you will not need a dado cutter or an understanding of how to make box joints for this project.

I decided to make my own nuc boxes for a number of reasons. First, I didn't want to buy a cardboard nuc box from my bee supplier and end up tossing it into the recycle box. Second, I've built everything else for my hives, so why stop at a nuc box? Third, I'm planning on using these boxes in the future as swarm traps and for making additional colonies by *"splitting"* my original colonies down the road.

So – let's get started. But, before we begin, let's talk about safety***. Make sure that you read and understand how to SAFELY operate your power equipment. In some of the pictures below, the safety guard has been removed so that you can get a better understanding of the photo. NEVER operate your equipment without the original guard or an auxiliary guard in place!***

Nuc Body Material List:
Front & Back: ¾" x 7½" x 11".
Sides: ¾" x 19-7/8" x 11".
Bottom: ¾" x 7½" x 18-3/8".

Begin cutting the parts of the box to size. Either use 1"×12" lumber or glue up some1"×6". I chose the second option because it was what I had available in the shop.

Using a 3/8" countersink bit, drill the holes for the screw locations on each piece to a depth of 3/8" (half the thickness of the wood).

Using a 7/8" Forstner bit, drill the hole for the front entrance. The center point for this hole should be 1¼" from the bottom end of the board.

Next, cut the rabbet joint on the inside of the front & back pieces. This joint will support the five frames in your box. This joint can be made in two passes on the table saw. First, set the rip fence to 3/8" and the blade height to ¾". *Make sure to secure a feather board to the table saw top in order to help stabilize the stock as it is passed over the blade.*

Next, lower the blade to 3/8″ and adjust the rip fence so that there is ¾″ distance from the *left* side of the blade to the fence.

Now assemble the box using #8 1½″ galvanized screws and exterior wood glue.

Fill the screw holes with a dab of glue, insert wooden plugs, trim to flush and sand the box.

Now, make the handles for the boxes. The handles could be as simple as some scrap lumber screwed to the box or something a bit fancier. I choose the latter and began with some 2” x 2” lumber that I ripped at an eight degree bevel on one side. The eight degrees will allow for rain run-off and act as an awning to help keep the front entrance dry. I then lowered the saw blade to ¾” and removed a ¾” x ¾” notch. **This area will provide space for your hands when lifting the box.**

Next, cross-cut the strips to 6¼″ and glue and screw the handles, using 1¼″ deck screws, from the inside of the box.

Telescoping Top Material List:
Plywood: ¾″ x 9½″x 20½″.
Front & back strips: ¾″ x 2″ x 9½″.
Side strips: ¾″ x 2″ x 22″.
Metal cover: 14½″ x 25½″.

Begin by cutting these pieces to the required width & length and countersink screw locations in the front, back & side strips.

Just like the nuc body, glue, screw, plug, sand and paint the assembled cover.

Once the paint is dry, evenly position and trace the outer circumference of the cover on to the metal sheet. These pencil lines will become the 90 degree folds which must be bent for the cover. Using metal shears cut a 45° angle from each edge of the metal sheet to the outline of the top circumference.

Using a firm 90° edge (like the end on your table saw) begin bending the metal along the two longer sides of the metal cover. Take your time and only exert a bit of pressure as you move down the pencil line. Continue repeating this process until you have a nice crisp 90° edge.

Now, screw those edges to the sides of the cover with #6 x ½" pan head metal screws.

Next, fold the 45° edge from the sides onto the front and back. Repeat the same process for the front and back of the cover, but this time secure the 45 degree edge onto the side with a pan head screw.

Inner Cover Material List:
Plywood: ¼" x 7¼" x 18-1/8"
Front & Back Strips: ¾" x 1¼" x 9"
Side Strips: ¾" x 1¼" x 19-7/8"

Using a 7/8" Forstner bit, drill two holes in the center of the plywood so that the distance is 3¾" in length from the outside of each circle. Cut out the rest of the shape using a scroll saw, jig saw or coping saw.

The front & back strips of the inner cover are connected together by creating a lap joint. It's a fairly easy joint to make and consists of removing half of the thickness of stock on the opposing face of each piece. In order to make this joint, set the table saw blade to 3/8" and remove 1¼" from the *opposite* ends of each strip. This will be done in several passes with the help of your miter gauge.* *Remember to never cross-cut stock with a miter gauge when it is butted up to the rip fence. This could potentially bind the stock and cause dangerous kick-back. Instead, clamp a piece of scrap wood to a portion of the rip fence that is located before the blade.*

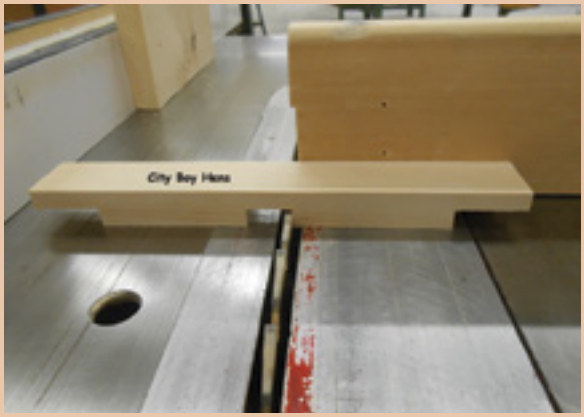
Now is a good time to cut the groove in these pieces in order to accommodate the ¼" plywood. Set the table saw blade to 3/8" for height and the fence to 3/8" from the *left* side of the blade. Using a feather board for additional support, rip this slot in all four pieces. Adjust the rip fence (depending on the thickness of your blade) to make a second pass in order to complete the ¼" groove. *Don't forget to alternate your strips for this step!*

Next, cut the *entrance* in the inner cover. I made mine 3/8" x ¾". Once again, make sure to secure an auxiliary fence to the rip fence in order to avoid potential kickback.

Finally, glue and clamp the pieces together and sand after the glue has completely cured.

And – there you have it, your very own five frame nuc box. Before you know it you'll be splitting hives and maybe even lucky enough to catch a swarm or two! BC

Rick Andrews lives in Southern Ontario, Canada with his wife, kids, cat, chickens and honey bees. You can follow his chronicles at ***www.cityboyhens.com****.*



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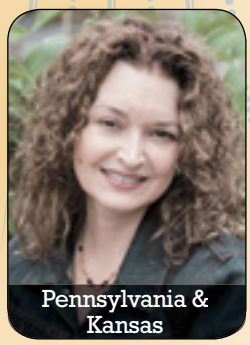

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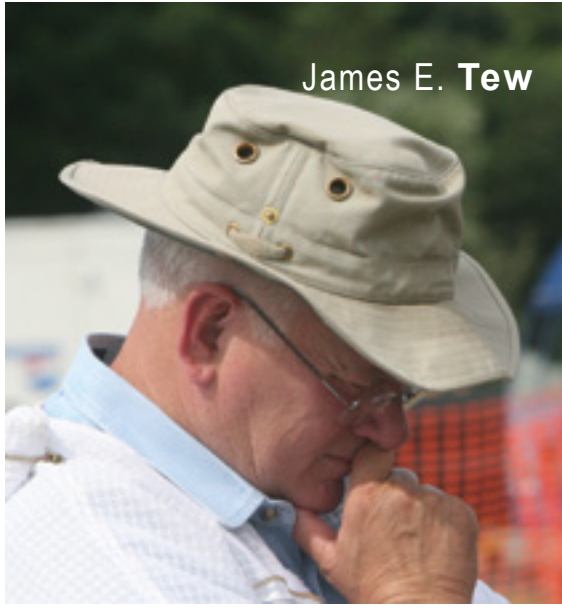
Better Hive Stands

This may be the Golden Age of hive stands



What a pleasant surprise

Last month, I wrote that, *"I would like to come up with a design for individual hive stands rather than the communal stands that I now use. If any of you have an idea for such a hive stand, I would enjoy having a look at it."* Some of you responded with photos and information about your personalized hive stands. All beekeepers have hive stands of some sort. Here's a look at what some of your peers are using.

L.C. from Northeast Oregon

I read your article in *Bee Culture* magazine and am sending you pictures of the bee stand I made from 2x4s and 1x4 scraps and a picture of my bee set up. The stand is 18" tall and made for eight-frame hives. We have skunks in NE Oregon, and I thought a stand was something that ought to be made for the bees' sake. This is what I came up with.

L.C.'s hive stand for an eight-frame colony.

L.C.'s hive stands and convenient work table with storage.

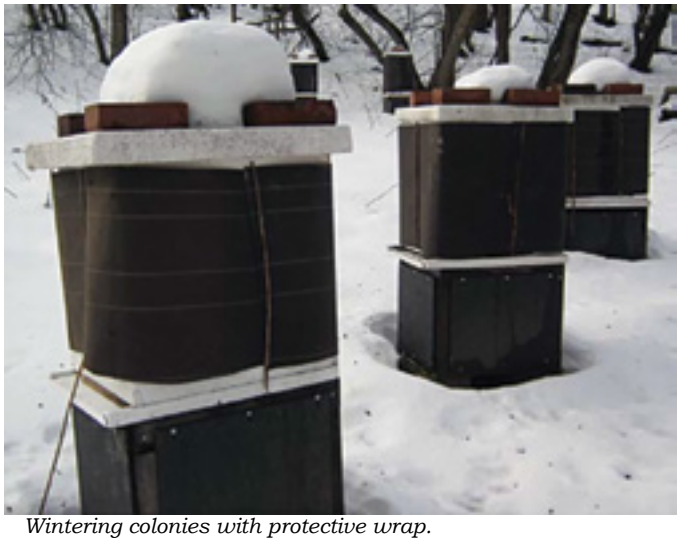
E.K. from Manlius, NY

In response to your request for a hive stand, I am providing you with my design, which has stood the test of time. I have tried commercially produced stands with built in *Varroa* trays, concrete "cinder" blocks, 4" x 4" multi-hive rails, etc. This has ended up being the best (especially for northern beekeepers) and represents the culmination of ideas from other beekeepers and my own experiences. While it can be used as is, I designed it to work in conjunction with a screened bottom board of my own design (no mite tray) and black panels on all four sides to provide a dead space and control winds and Winter weather.

Here are the benefits of the design:

1. Stands have been made with pressure treated lumber. I now use weathered pressure treated due to all the discussion about the impact on bees.
2. Approximately 16" off the ground to lessen the impact of skunks and other varmints. Height is less than 16" to maximize standard lumber dimensions.
3. Stand is flush with hive bodies on three sides to eliminate a perch for varmints (except the front where the bottom board overhangs). Landing board, part of bottom board, is just over 1" wide.
4. Stands are put on bricks/rocks rather than direct contact with the soil to increase life. I like to use two 2" x 8" x 16" solid concrete blocks (the kind used to cap a cinder block wall). I place one level under the front feet and one under the back feet.
5. The stands I use also have plywood panels on all four

Hive stand without and with panels installed.



Wintering colonies with protective wrap.

sides, painted flat black, to provide a 16" "dead space" due to the screened bottom board that the bees seem to like allowing the queen to lay down to the bottom of the lower box. The panels are removable for the Summer, although I have evolved from removing all four – to only removing one on the southern exposure – to leaving them on year-round. There is enough gap at ground level for plenty of ventilation although beekeepers in other climates may consider using a lighter paint color or foregoing altogether. I developed a system that allows me to install and remove the panels without tools, although it still needs some improvement. The reason the panels are painted "flat black" is to maximize solar gain at mid-day in the Winter, which allows the Winter cluster to move to honey stores during the more marginal cold spells.

6. Simple screened bottom board is placed on top to provide ventilation, lessen the impact of *Varroa* and create a dead space below.
7. Height above the bottom board screen/landing front is only 3/8" high rather than the traditional ¾". Never had a mouse enter unlike my experience with ¾" traditional height rims (p.s. got the idea from a polystyrene BeeMax bottom board that I tried. It only has a 3/8" high space).

M.K. from Niskayuna, NY

Attached is recent picture of a hive stand I made. I made a 2x8 (2x10 would work, too.) rectangular structure with front to back cross pieces to maintain a width for the hive boxes, replacing concrete blocks that frost-heaved. This was screwed into garden fence posts that were hammered well into the ground. I added some small one-foot length one-inch angle brackets to keep the hives from sliding off, as there is nothing under them.

Frames that are removed from the colony for inspection can be temporarily stored in the structure's open space.

Garden posts with 2x8 frame bolted to it.

R.O. from Clinton, NY

I am a hobby beekeeper with about 10 hives. This is a stand I have all my hives on. It's about 13 inches high I use screened bottom boards and slatted racks. I can slide a sheet of quarter inch plywood under when treating or testing for mites or for Winter.

R.O.'s basic hive stand.

Hive stand with plywood insert in place.

M.H. from Boulder Creek, CA

My husband and I are hobbyists now entering our fifth year with bees. We live in the redwood rain forests of the Santa Cruz Mountains about 30 minutes from San Jose and 30 minutes from Santa Cruz on the Monterey Bay.

When not suffering a drought we can see up to 70 inches of rain between Nov 1 and May 1 with an average of about 55 inches. In winter evening, temperatures can be in the low 20sF with an occasional dusting of snow. In summer we frequently hit 100°F during the day. We also have all sorts of wild life to contend with ranging from raccoon, skunk, and possum to coyote, bobcat, and mountain lion (no bears).

When we decided to enter the beekeeping arena, we wanted hive stands that would keep the hives stable, off the ground (out of flood waters and away from the cooler air) and protected from Winter storm winds and hot Summer heat. We opted to position our hives along a six-foot western fence for wind and sun protection.

We came up with a very flexible hive stand

Hives positioned on 4x5 posted and cement blocks.

configuration using groups of three cider blocks at the ends and 4x4s spanning the gap. The length of the 4x4s determines the gap distance.

Some folks may feel the 4x4s are too close together offering too little support front to back. We have not found this to be an issue. The hives could be angled to further reduce drifting possibilities. Ideally two hives on an eight-foot span gives ample space for placing equipment during inspections. We are currently set with three colonies in that span and things are a bit tight.

Last year most colonies were five or six boxes high – about 200lbs each – so weight on the 4x4s is not a concern. (We run all 8-frame medium equipment on screened bottom boards (open year round), with slatted racks and Vivaldi boards instead of inner covers.)

With our hives abutting the fence we must stand between hives for an inspection rather than behind. It's not ideal, but we have gotten used to it. Eventually we will lose a colony and regain the space between hives. (We have had an exceptional success rate with zero losses to date.)

Commercially produced hive stands

During recent years, commercial companies began to design and market hive stands that were made of some combination of wood, metal or recycled plastic. Since I am a longtime beekeeper I was trained many years ago to use the typical cement block hive stand – two blocks front and back of the hive bottom board. I have never really liked cement blocks for this use. The blocks were just ever-so-slightly too narrow and to this day, they are very heavy.

BeeSmart Designs produces a plastic hive stand that is available from many bee supply sources. Again, I confess that I have never – up to this point – used this or any other manufactured hive stand so my comments here are not an endorsement of the product. Since BeeSmart responded with information about their product, I am including it for your review. Some characteristics of the hive stand are listed below.

1. Raises hive 12" off ground for easier access and better ventilation.
2. Works with any bottom board, no wood hive stand needed.
3. Hive sits on heavy-duty rails for total support.
4. Available for eight-frame and 10-frame hives.

The "Ultimate Hive Stand."

5. Built-in drains keep hive and hive components dry for longer life.
6. Large footpads spread load and ensure stability.
7. Fast and easy assembly. Less than two minutes with only a screwdriver.
8. Ballast ports allow legs to be filled with sand for additional stability.
9. Made in USA from recycled materials.

After all is said and done....

In 2008, I wrote an article for *Bee Culture* named *"The Lowly Hive Stand."* I went into some detail about the basic features that solid hive stands would need. At that time, other than educational efforts intended to help beekeepers of all levels, little was decided and no specific model arose to the top of the hive stand pile.

Through the years, nearly everything plausible has been used to support beehives. The time-honored slanted landing board style is still in all the bee supply catalogs. To my thinking, the only true benefit was that it kept the hive about four inches off the ground. It has a slanted landing board with the notion that it somehow helped heavy-laden returning foragers alight more safely. The main attribute that I found to be dependable was the appreciation that mice showed for being provided such a protected and warm nesting site beneath the hive. These four-pieced cypress devices have come as close as possible to being the standard hive stand. They were cheap, they were simple, and they worked (some). Indeed, the hive stand has always been a piece of beehive equipment that encouraged creativity. To many, nearly anything can be used as a hive stand, while others devise unique designs, and now many of us just buy our hive stand from commercial suppliers.

Why does the hive stand remain the most non-standardized piece of hive equipment? I'm guessing that it is because our time-tested system of keeping bees

in artificial domiciles requires beekeepers to keep the hive too near the ground – but that's just me. There is no "natural" model for designers to follow because temperate honey bees rarely nest near or on the ground. On occasion, one may find a colony with the entrance *near* the ground, but the internal nest will be much higher up within the wall or hollow tree.

I simply must give up....

I have invested more than three hours time searching for a single black/white photo that I have seen of 20-30 beehives on a high platform in a Tupelo swamp. Through the years, I have seen this photo time and again, but now I simply cannot find it. The high platform was built to protect the hives from bears in southern Tupelo swamps.

I'm frustrated because this photo would help make my point – these tupelo-honey-producing beekeepers had unintentionally positioned the colonies on the perfect hive stand 10 to 15 feet high – perfect for the bees but probably not for the beekeepers. The amount of labor required to build the heavy platform in the swamp is mind-boggling.

But that is not the only reason hive stands designs have always been wishy-washy. Space requirements. Even in our earliest beekeeping years, hive stands were unloved. Think about it. You are using a horse-drawn wagon loaded with bees and beehives. You travel at a glacial pace out and back. So you feel that using a good part of the wagon space to load hive stands is a good idea. Nope. In some of the old photos, beekeepers cut sections of old growth trees (about 10 – 12 inch thick wheels) to provide *"disposable"* hive stands. They were cut near the yard and were never moved from that yard. So cheer up beekeepers. Todays hive stand styles are as good as they ever have been. In fact, this may be the golden age of hive stands. BC

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The Man Who Would Be A Hero

The Story Of Apis Avenger

Tony **Sandoval**

I wasn't always able to control bees ya know. I was just like everyone else for most of my life. It wasn't until the day I got hit by a produce truck that things changed. My name is Jethro, and no, it's not Bodine. Keep your smart comments to yourself.

Ya see, I was all of about 23 years old and I was working as a night guard for a security company that handled "special" circumstances. That night, I was there to make sure that no environmentalist whackjobs broke into this small town jail where some of their members had been locked up for trespassing on a nearby farm that produced honey.

The whackjobs had decided to "free" all of the bees in the hives from their supposed "slavery" on the farm. Who knows with whackjobs.

Any moron with an internet connection can google beekeeping easy enough to know that bees aren't "slaves." But hey, whatcha gonna do with a bunch of people who think logic and facts are a different kind of breakfast cereal?

Anyways, sure enough, I took a quick patrol around the jail perimeter at about 4 a.m. and here comes a truck squealing around the corner and pulls right up to the jailhouse doors. A bunch of weird looking folks start pouring out of the back of the truck and rush the front doors. Someone must have had a stick of dynamite or something started before they got out of the truck because before I could get there, there was a huge explosion.

I ran around to the front end of the truck to see if I could get into the doorway and break things up. Someone in the cab must have panicked when they saw me because when I looked up, the guys eyes were wide and I felt the rumble of the truck on the pavement before I felt the grill hit me square in the chest.

As I fell sideways to the ground with all of these folks still running around like madmen, I noticed there were a lot of bees crawling around. Apparently, these idiots had tried to use this truck to steal hives with before coming to rescue their buddies. Like I said, whackjobs. Can't get anything right.

I must have hit my head when I fell because when I woke up in the hospital, my head was all bandaged up and the back of my head hurt like crazy. The nurse told me that I had a pretty good concussion and a nasty bump on the back of my head. Then she said that when they brought me in, I was covered in bee stings, but the medicine must have cleared it up because now there weren't any signs of any of them.

They released me a couple of days later and I called my employer from my new friend's house. Hey, can I help it if nurses find me irresistible?

My employer said he had a new gig for me if I was up to it. It would start in a couple of days and he gave me the details that I wrote down on the back of a sheet of paper I found on the nurses' kitchen table.

When I got to the new gig, I was impressed to find that it really was a farmhouse. The job details said the job was babysitting a farmer's barn but I just couldn't see that being real. There it was though, plain as day. No one was home it seemed but there was a note in the back door to say they would return shortly.

I took a walk to where a huge, green barn sat about 50 yards away from the main house.

It was locked up tight with new lock sets on every door. All the windows had been shuttered as well. Now what the heck is going on in a barn that it requires locks and its own bodyguard? I figured I would find out soon enough.

While I waited, I walked around

behind the house and noticed a honey bee buzzing about an inch away from my arm. "Knock it off!" I said out loud to the bee, hoping it wouldn't land on me and sting me. It was weird because the bee stopped moving toward my arm and just kind of hovered there near me.

There was some kind of tree blooming a little further off to the north. I said out loud to the bee again, "Go over to the tree over there and leave me alone." I pointed at the tree as I said it like the bee was going to understand me or something. As I watched, the bee headed straight to the tree. No kidding!

I thought to myself, 'no way, there's no way that bee knew what I was saying' and I followed it over to the tree. When I got there, I noticed there were a lot of bees buzzing around the flowers on the tree, making a buzzing, droning sound as they went from flower to flower.

I couldn't tell which bee was the one I told to come over here as I tried to see as many as I could count. They weren't bothering me at all. It was like I wasn't even there and didn't matter one whit to them bees. I watched them for awhile and then I turned around to go back towards the farmhouse.

I said out loud to the bee I had told to come here, "Well, I suppose you can hang out with me as long as you don't sting me." and I started walking back to the house. When I got there, I walked up on to the little cement patio that the back door opened onto and looked into the screen door where I had found the note.

The door still had a storm window on the top half of the door and could see my reflection in it. 'No freakin way!' I thought and I turned around really fast and sure enough, I wasn't seeing things after all. There really was a cloud of bees hovering right behind me!

I have to say, right about then, I was totally speechless. I just stood there like an idiot for about five minutes trying to figure what the heck was going on. Finally, I just said, "Go back to the tree." and holy smokes, they did! They just slowly turned the whole cloud around and buzzed right straight back to that tree.

What in the name of Burt was going on here? I stood staring at the bees as they drifted back to the tree when I heard a voice behind me saying, "What did you just do?" I turned around, it's not often someone sneaks up on me, and there was this short, fat little fella standing there in a pair of jeans and a t-shirt that said "Keep Calm and Keep Bees."

He looked like he was near about 60, gray hair and clean faced. I asked, "Who are you?" and he replied, I'm Pedro, this is my house. Who the heck are you?" He didn't look.

I told him my name and who I worked for. "Oh, OK", he said. "I knew you were coming over today and tried to hurry back but what the heck was that all about?" He was looking at me like I was a genie popped out of a bottle or something.

I told him about the whole thing, from telling that first bee to go to the tree and everything else. He listened quietly, nodding and saying, "mm hmm" every now and again. Then he said, "Well I've been a beekeeper for almost 45 years now and I have never seen or heard of anything like that before. Can you do it again?"

Do it again? Now it was my turn to look shocked. I didn't think I had done anything to begin with and I said as much. Pedro looked at me as if I was an idiot and said, "Well of course you did something. Either it was your words, which I don't think bees can understand our actual words, or it was what you were thinking. Maybe it was your thoughts they could hear?"

Pedro looked back at the tree and told me to tell the bees to come back here. I shrugged. I thought he was crazy, but then again, maybe I was crazy thinking bees were following me. I looked at the tree and instead of saying it out loud, I thought really loud at them, 'come over here.'

I looked over at Pedro as if to say, "See, I told you it wouldn't work," when the bees pulled themselves into a flying cloud again and started buzzing their way right toward us. This was wild. It was just mind bending. All Pedro could say was, "Holy Shnickers!"

The bees came within about three feet in the front of us and just hovered there. I pointed at a lawn chair next to Pedro and thought at them again, 'Set on that chair.' The whole cloud moved toward the chair and within a minute, every part of the chair was covered with bees.

Pedro and I spent the whole rest of the day trying different things to get the bees to do.

I even had the bees completely cover him without a single sting. You'd never seen anyone so happy to be covered in honey bees.

As we experimented with my apparently new ability, he told me that he had a new beekeeping invention that would revolutionize beekeeping and that's what I had been hired to protect until the company he

contracted to build these things could come and get the prototypes.

Now however, he was far more interested in what I could do. He said my ability was of way more importance than his machine. He wanted me to keep working with him to see how many bees and from how far away I could control them.

Over the next few days, we tried all kinds of experiments with the bees. Finally, about four days in, we decided to go into town and get something for lunch. On the way out of the diner after we'd finished eating, we heard someone scream from down the block.

We didn't exactly run but we fast walked to see what was going on.

When we got to the end of the next block, we could see that a woman was scared stiff, afraid to move as a mountain lion had crept up and was growling at her with a low rumble. It's very uncommon for mountain lions to attack anyone during the day, this one had to be really hungry to show so much aggression like this.

A guy who had come from the other way turned around saying he was going to get his rifle. I looked at Pedro and I could tell he had the same idea. I couldn't let this mountain lion get killed but I couldn't let her stay around here either.

In my head, I hollered as loud as could imagine to every bee that might be around to hear me and I told them to come to me. Within no more than two minutes, there was a cloud of bees so big it had to take up the space of one of those hot air balloons. The bee cloud hovered, not doing anything else, about ten feet away from us.

I silently told the bees to cloud around the mountain lion and move slowly West. The bees moved to completely surround the mountain lion and it started to back off, then completely turned and started running away. I had the bees follow the big cat for about two miles before going back to where they had come from.

That was the first time I had used my special ability to help someone. I liked the feeling I got from seeing that neither the lady had gotten hurt and neither had the mountain lion. Heck, even the bees didn't get hurt because they hadn't stung the cat at all to get her to run away.

Since then, I've quit my security job and moved into a place in this small town. Pedro and I have been working together to see just what I can do and a few surprising things have been discovered. Not only that, but I have become a pretty good beekeeper in my own right with Pedro as my mentor. BC

Some Outstanding Leguminous Bee Trees

Connie **Krochmal**

The leguminous trees are reliable choices for the bee garden. Among these are a number of large trees, some of which are native. The group includes the widely popular honey locust as well as lesser known ones like the Japanese pagoda tree and the native yellowwood.

Amur maacki (*Maackia amurensis*)

An ideal plant for small gardens, this can produce multiple trunks. It is hardy to zone four. Amur maacki is native to Manchuria, Japan, and Korea. Of the six Asian species, this is by far the most popular. These trees are related to yellowwood.

Slow growing, Amur maacki is usually 25 to 30 feet in height. In the wild, this can reach 45 feet. Mostly upright, it develops a rounded crown with spreading, arching branches and attractive, rich reddish-brown, peeling bark. The plants are named for Richard Maacki (1825-1886), a Russian naturalist. The tree was introduced to the U.S. in 1880.

This outstanding plant bears alternate, compound, feather-like foliage, eight to 12 inches long. The opposite, oval to elliptic leaflets, seven to 11 in number, are up to 3½ inches in length. Initially silvery gray, these later turn deep green. The slightly winged, flat pods are three inches long and ½ inch wide.

Amur maacki is a great Summer-blooming tree for bees. Its fragrant blossoms usually open in July and August. The delicately scented, pea-like flowers form long, dense, erect, upright, terminal clusters about six inches in length. They're white with deep blue tinges. The individual blossoms are only about 1/3 inch long.

Easy to grow, Amur maacki demands little routine care. Minimal pruning is required. This reliable plant needs no special growing conditions. It rarely suffers from serious disease or insects.

Suited to full sun, the tree grows in almost any reasonably moist soil and adapts to a range of pH levels from acid to alkaline. Amur maacki tolerates both heavy and light soils. This species grows best in a moist, loose, well drained soil, especially a moist loam. It withstands wind and drought.

Amur maacki is propagated by seed, softwood cuttings, and root cutting. Grafting is another option.

A related species known as the **Chinese maacki** (*Maackia chinensis)* is also cultivated. It is slightly less hardy than Amur maacki. This species is similar except for the narrow, shorter leaflets and larger blossoms. Down covers its shoots, young leaves, and flowers.

Amur maacki (Maackis amurensis)

These trees bloom from mid to late Summer. As with most legumes, they produce nectar and pollen. Bees are very fond of the flowers. The trees are a source of surplus honey.

Black wattle (*Acacia decurrens)*

Also called green wattle and early black wattle, this is native to eastern Australia and New South Wales. It is related to several native acacias found in the Southwest and along the Gulf Coast. Black wattle is hardy to zone nine. Widely planted in California, the tree has naturalized in some regions.

This evergreen reaches 40 to 50 feet in height and is half as wide although it can sometimes be smaller. Black wattle is a handsome, spreading, upright, fast growing plant, which is sometimes shrubby. It features slender, sharply angled branches that can be hairy. The inner bark is reddish.

The deep green, finely textured, feathery leaves are doubly compound with large numbers of linear leaflets, only 1/3 inch long. Seed pods are three to four inches in length.

The bright to deep yellow, small, scented blossoms typically open from late Winter to early Spring, depending on the location. Forming spherical heads, the flowers appear on six-inch-long panicles.

Suffering few insect or disease problems, this weak wooded, shallow rooted tree features limbs that tend to break easily during storms. Normally, black wattle requires little pruning.

Several varieties of this fast growing tree are available. This needs full sun to partial shade. Adapted to both moist and dry conditions, black wattle is tolerant of salt. It thrives in most reasonably rich, well drained soils. The species adapts to a range of pH levels from acid to neutral.

The tree is called black wattle because early European settlers in New Zealand made mud-daubed

Black wattle
(Acacia decurrens)

wattle houses from its branches. In addition to black wattle, there are other related species that are similar. A number of these have naturalized in Florida and California.

Black wattle is an excellent bee plant. It is considered a major honey source in Hawaii and California.

Japanese pagoda tree (*Sophora japonica or Styphnolobium japonicum*)

This tree is also called Chinese scholar tree and Japanese acacia. A very reliable, attractive, flowering ornamental species, it is hardy to zone six. In zone five, the plant sometimes experiences some Winter damage.

Japanese pagoda tree is native to Japan, China, and Korea. Although a number of related species are cultivated around the world, this one is the hardiest.

The plant is a very handsome, broad headed tree. Unlike most other legumes, it doesn't fix nitrogen.

The tree reaches 40 to 80 feet in height. A fast growing species, it can easily grow ten feet per year. The gray bark resembles that of ash. The stiff, drooping branches are very picturesque.

The elegant, alternate, pinnately compound leaves are up to nine inches in length. The oval to narrow leaflets, varying from seven to 11 in number, occur in pairs except for the terminal one. Hairy underneath, the leaflets are two inches long. One variety has creamy white variegation on the foliage.

The small, scented, pea-like blossoms form large, showy, terminal panicles. When in full bloom, this tree is absolutely gorgeous. It is covered with creamy white blossoms, ½ inch long. These open in Summer from late July to September. One cultivar has violet blooms. The flowers are similar to those of another native leguminous species – the yellowwood. The bean-like pods are three inches in length.

Several varieties are available, including a columnar one. Needing full sun, Japanese pagoda tree adapts well to city conditions. It does best in poor to slightly rich soils. Tolerant of most soil types, this prefers a neutral to slightly acid pH. The tree adapts to rocky situations.

Requiring minimal pruning, it is relatively free of pests and diseases. However, this can occasionally experience stem canker and twig blight, particularly in zone five. The latter is largely due to Winter damage.

Japanese pagoda tree
(Sophora japonica or Styphnolobium japonicum)

Japanese pagoda tree can be propagated from softwood cuttings and seeds as well as grafting and layering. Seeds, which should be planted soon after they're harvested, can be slow to germinate.

This exotic tree took a circuitous route in order to reach the West in 1647. A French Jesuit priest in Peking sent some seeds via a Russian caravan, which stopped in Peking about every three years, to a botanical garden in Moscow.

Later, some seed-grown plants were sent from Moscow to a Paris botanical garden. The plant was introduced to England in the 1750s and the U.S. in 1811. Upon arriving in New York City at the Elgin Botanical Garden, which was located from about 1801-1810 on the site where Rockefeller Center was later built, the trees were initially grown in greenhouses. At that time, little information on their hardiness was available. Now, this is mainly grown in the East as a shade tree.

The plant was widely used in its homeland as a shade and street tree, especially in Canton and Peking. In China, it was called the scholar tree because it was planted as a shade tree around the graves of Chinese scholars and mid-level Chinese government officials.

There are related cultivated and native species. **Pagoda tree** or vetchleaf sophora (*Sophora davidii)* is a shrubby introduced form that blooms in June. **Texas sophora** or coralbean (*Sophora affinis)* occurs from Louisiana to Texas and Oklahoma. This native forms thickets and grows mostly in limestone areas, along streams, and ravines.

Mescalbean or coral bean (*Sophora secundiflora)*, also called Texas mountain-laurel, is native throughout the Southwest. This forms thickets and frequents wet places, especially along streams. It occurs in coastal areas as well as in the mountains to 5000 feet elevation.

All of these species provide nectar and pollen for a month or more. They're considered valuable trees for bees, who eagerly work the flowers. Lengthy wet periods can interfere with the nectar flow. Hot weather brings the best flows. Each blossom yields two mg of nectar daily, which contains 40 per

cent sugar. In the past, reports indicated that bees were poisoned by Japanese pagoda blossoms in Central Europe. However, this was never substantiated, and was apparently linked to certain climatic conditions.

When enough of the trees are available, this can provide surplus honey of over 50 pounds per colony. In Europe, the trees yield about 300 pounds per acre. The honey has a pronounced flavor.

Yellowwood (*Cladrastis lutea*)

Recommended for zones four through eight, this attractive, long lived, slow growing native is an excellent flowering tree for the bee garden. It was discovered by Andre Michaux, a French botanist, in March of 1796 near Fort Blount, which was located about sixty miles from Nashville, Tennessee. He originally classified it as *Sophora* because it resembled the Japanese scholar tree. Later, the genus name was changed to *Cladrastis*. The common name refers to the yellow heartwood, which once served as a dye.

Within its range, this tree is relatively rare. It occurs most frequently on forest slopes in rich limestone soils. Yellowwood is native over a wide area. Its range extends from Ohio, Indiana, Illinois, Kentucky, and Tennessee into the Southeast. The trees that now occur in Oklahoma, Missouri, and Arkansas are believed to be ones that naturalized after some trees were planted in the area.

Yellowwood reaches 30 to 55 feet in height. With a relatively moderate growth rate, it typically grows to about 20 feet tall within 25 years. However, the tree can take 50 years to reach its mature height. This low branching plant has a broad, rounded, graceful, compact shape. With a forked trunk, it features zigzag branches and lovely smooth gray bark.

Its petioles are swollen at the base. The alternate, feathery, bright green leaves are pinnately compound. The oval leaflets, which number 5 to 11, are in pairs with an odd one at the end. They're four inches long with the terminal one being larger. These turn yellow in the Fall.

This tree is a vision of beauty when in full bloom for it is clothed with blossoms. Yellowwood tends to bloom heavily during May and early June in alternate years. It begins flowering at a very young age.

With five petals, the delicate white blooms open just as the leaves have started to unfold. These are very fragrant, especially at night. They appear in long, showy, loose, dense, terminal, drooping panicles, up to 1½ feet long. Wisteria-like, the flowers feature a bell-like calyx. The individual blooms are over an inch in length. A pink flowering variety is available.

The narrow, oblong, flat pods are four to five inches in length. Ripening in August or so, they resemble those of redbuds.

Grown as a shade and flowering tree, the species is hardy to zone three. Full sun is best, but it adapts fairly well to partial shade. This has some resistance to wind. Yellowwood is adapted to moist and slightly dry soils. The tree thrives in moist, rich, well drained soils, especially those found along waterways. Tolerant of various pH levels from slightly neutral to somewhat acid, it prefers a limestone-rich soil.

Bareroot yellowwood trees don't transplant well. If pruning is needed, this should be done from Summer through late Fall. Easy to grow from seed, yellowwood can also be propagated from root cuttings. The plant usually has few insect or disease problems.

There are several related species native to Asia. **Japanese yellowwood** (*Cladrastis platycarpa)* is slightly smaller.

Considered a good nectar and pollen source, yellowwood flowers invariably attract lots of bees. Wherever the trees are plentiful, the plants provide a surplus honey. This is light amber with a strong distinctive flavor. BC

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

Yellowwood
(Cladrastis lutea)

DOWNTOWN

It Pays To Know Your Urban Natives

There's an image floating around the Internet (kind of like the one here) that compares honey bees and wasps, and uses R-rated language, but it might just represent the dawn of a brave new day. What day is that? The first of a season where everything that buzzes is not a "bee," and every "bee" is not an airborne hazard to public safety. It has been exciting to see it popping up in places not run by and for beekeepers, and to see that most versions mostly contain accurate (if limited) information.

You see, this is not an article about native *human* city dwellers, but about native bees, a vast and daunting task for which managing *Apis mellifera* is not much preparation. But as in most beekeeping stuff, one door always seems to open another, and the bees are patient instructors. Our daily management tasks may apply only to the European honey bee, but in making a place for them in the city, it has proved worthwhile to learn how to make major connections and distinctions between *these* bees and *those* bees. And those *NOT bees*!

This is a complicated topic. In the United States, official publications frequently estimate about 4,000 bee species: this is a moving target, as new species are identified and others potentially become extinct. Hereabouts, experts estimate about 2,000 species and have identified over 400, but good numbers are hard to come by. Native bees are not associated with commercial crops (so there are few dollars chasing them), and completing a census requires deep expertise and considerable effort. So you are going to find a comprehensive list hard to find.

Everything That Buzzes Is Not A Bee

Because we are beekeepers, however, we are likely to be considered the local authority on the insect kingdom, but not so much that folks would like us to go on too long about how honey bees *are* different. As a kid, my first impression of beekeepers was that they were overly specific, uber-geeky hair splitters. Always piping up with "That's not a bee, that's a wasp!" or some such. A reasonable person like *me* would never be so pedantic.

Well. Huh.

The usual reasons I deploy for going to this additional form of urban effort – i.e. learning which bees, hornets, and wasps your neighbors are likely to encounter – are things you may have come to expect from these columns. In situations where there is a "bee" problem, urban beekeepers stand a decent chance of being blamed for it, and restrictions may result. Also, when we know enough to help people with a bee problem – even one that has nothing whatsoever to do with managed bees – beekeepers become a valued asset to the neighborhood. Third, many urbanites get into beekeeping for environmental reasons, we want to *help*, and providing the information that protects natives and even extends their habitat is beneficial to all. Finally, there is even a fourth reason this time: if we can spot and flag a true safety problem and help resolve it, we can save pain and, potentially, lives.

Here's a story about the impact of ignorance: last year, Samantha took our short course, and set up her woodenware in a really lovely place in her yard – she's one of the lucky ones with a setback to die for that is actually a good location for bees. Sam opted to wait for a nuc rather than go with an early package, so her empty hive bodies sat out there for much of April and May. A week or so after the boxes were placed, however, the city got a barrage of phone calls from her next door neighbor claiming that children were being stung left and right, and ER visits had resulted. The neighbor's yard was actually infested with yellow jackets, and even after this was pointed out, suspicious mutterings to the effect that the hive had somehow "attracted" wasps kept Sam biting her nails. Her neighbors

needed to stop blaming Samantha, and start understanding the impact some gardening choices (in this case, leaving piles of hay around) were having on the well being of their kids.

So all those beekeepers, over all those years, who kept jumping up every time and saying "That's not a bee!" were making an important point about what happens when folks do not challenge, or are not invited to change, the thinking that "they're all the same" and "they don't belong here."

Beekeeper as Bee killer?

We are all used to hearing fear come back at us when we broach the subject of urban bees. Therefore, it probably should not have been a surprise to see the kinds of questions that we receive (in the hundreds) every year from folks who just want to make all bees, beneficial or not, go away, when we publicly offer to collect swarms.

Though the downtown club website contains good information (including pictures!) on what is and is not a swarm, we get a lot of calls and emails. Less than one in 100 concerns honey bees or swarming (Note: For the general public–and some beekeepers who make me want to tear out my hair – "swarm" is a word that means "more than one, especially bugs," and no photo or detailed description will convince them that a holly hedge undergoing energetic pollination is not a swarm).

I might complain to you, but we try to take these phone calls, get folks to describe what they are seeing, and tell them what they have on their hands. We try to help them not be afraid, and even become curious, with just a couple of questions like "What are you seeing?" and "Is anything blooming right now?" We want them to understand that we beekeepers did not create a problem here, that there *is not even* a problem here, and that we would like their help in protecting the cousins of our bees while they enjoy them, too.

Now that everyone seems to call from a cell phone, I keep a set of web links to helpful native pollinator pages (God bless you, Cornell Extension!) that are texted over with encouragement to see if that is something like what is going on. It makes one heck of an impression when we are right! We try to get people to be proud that they created healthy habitat, to feel like they are now stewards of gentle and beneficial ecological heroes, and to avoid pointless poison and expense. We have learned, over the years, which big native bee families are likely to become active, and then dormant, when, and in which order. There are some bigger species, notably *Xylocopa,* that make an outsized impression and receive special attention (see sidebar).

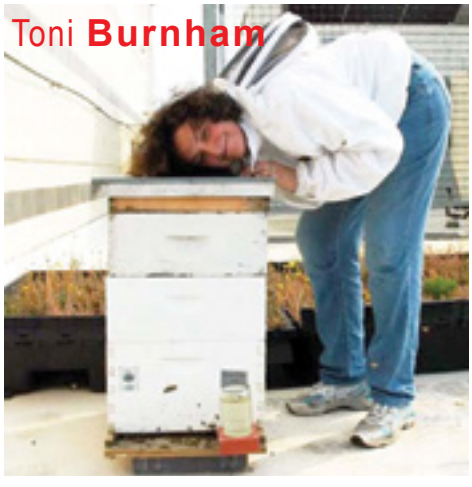
Considering that these bees are the ones that actually evolved in this ecosystem, and are individually better pollinators on the whole than the gals we are able to introduce, we really owe them some support and protection.

But taking into account the many climates, horticultural zones, and habitat features of North American cities, there's just no way this article can guess at, let alone cover, the species most likely to co-occur with your urban honey bees. Get with your local extension office or cruise the web site of the entomology department of your nearest land grant university. The Pollinator Partnership (**www.pollinator.org**) is developing a state-by-state series of pollinator identification guides. Finally, most of the bee clubs around here have at least one serious beek who has taken an interest in native pollinators, and may have a pretty good idea of what is going on. Like managing honey bees, local insight is everything, so don't ignore a nearby human resource!

When discussing the main native pollinators we have, the points our call takers like to make are:

- These bees *belong* here, and are an intrinsic part of the normal functioning of the ecosystem;
- Native bees are often paired with native plants, and are active while the latter blooms, often just a couple of weeks. Then they are likely dormant;
- Almost none of these species are interested in colonizing human houses, and since they don't store honey and are active briefly, damage is unlikely;
- Stinging is rare, often impossible, and usually the product of concerted human interaction;
- For ground nesting species, eradication requires copious poison released into the environment *or* extensive excavation *and* is unlikely to work anyway; and
- The ones that do the most hovering are usually males, and nature did not see fit to give them a stinger.

Later in the season, the calls will shift to a dicier discussion, as



wasp and hornet nests come up to full strength. Not all habitat can be shared (see the yellow jackets, above) but it is amazing how many bald-faced hornet nests around here survive when folks learn that 1) no, beekeepers won't take them; 2) the city does not do pest control on private property; and 3) they will have to pay someone if they are not content to let seasonal change and a hard frost take care of it. We keep the phone and the email of the Department of Health staff that are in charge of dealing with street tree nests, and an updated set of web links on "green" eradication. My friend Sean will, for a small amount of cash, come and bag a hornet nest and bring it to a wooded area to give it a chance.

Ever since that National Geographic film about killer Asian Giant Hornets (*Vespa mandarinia*) was released (*Hornets from Hell*, 2002), we get a question or two about European Giant Hornets (*Vespa crabro*) from time to time, mostly from folks who are scared out of their wits and wonder whether they should alert the authorities. The stings hurt, but they do not dissolve flesh.

It takes all kinds

We've had very few swarm calls this year, but we got one from a jogger who claimed a beekeeping relative and swore up and down there was a swarm settling in a yard northwest of here. Bee folks are getting antsy with so few freebies this Spring, so I took a chance and did a blast announcement to interested beekeepers that had signed up from that zip code. Probably half a dozen cruised by that front yard. A couple of beekeepers thought they saw someone home and knocked, but no one came to the door and I asked them to please refrain from getting arrested.

Later on, Nicole was passing by, and saw an older gentleman in the garden. She said she was a new beekeeper, and thought these looked like tiny honey bees: in fact, a number of beekeepers had been by to check them out! The gentleman, who was a recent widower, smiled and said, "Oh no, these are miner bees! They come out every year this time, buzz around for a couple of weeks, and are gone." And then he said, "Thank you for caring." BC

The Comedy of the Carpenter Bee

In case you don't have them, Carpenter bees (genus *Xylocopa*) are an impressively large bumblebee-like pollinator with highly territorial and not terribly bright drones. Their numbers appear to have increased locally, and the drones' habit of flying at any and all creatures in their chosen patch have made quite an impression. The drones are merely attempting to reserve all the females in these areas for themselves, and the females are mostly not seen. Their handiwork is, though: amazingly professional looking bore holes in soft wood, often with a tiny pile of sawdust underneath. Both the public and beekeepers seem to have it out for these marvelous pollinators, but local Master Beekeeper Dr. Wayne Esaias recently rose to their defense in a heated online discussion of their "misdeeds."

"Some responders are needlessly perpetuating fear of bees, and are not helping with education on the matter. Carpenter bees are excellent pollinators, and are quite benign when one knows their behavior. The 'damage' is insignificant, but is used by home repair people to extract significant $$ from ignorant homeowners in addition to causing [unnecessary] pesticide applications."

"At a very early age my parents showed me how to recognize drones by the conspicuous white spot between their eyes and to catch them bare-handed. My mom learned from her father. They've been nesting in the garage for over 75 years, and on a nice spring day there may be a dozen or more males 'guarding' their territory with nothing but bluster. Toss a dark pebble in the air and watch them succeed in 'chasing it away.' Face them head-on while they are hovering to confirm the white head, and make a quick grab."

"The only time I was ever stung was when I grabbed a female (a.k.a. a black head) by mistake from behind. I guess I was getting cocky. In those days I tied a black thread to drones and sold them in school for 50 cents. Back in the mid 50s I got suspended for three days after one landed on the music teacher's buxom chest while I was giving a tethered-flight sales demo. It landed on the point of closest approach, if you remember how mid-century undergarments were shaped, causing audible gasps from my buds and repeated shrieks from Mrs. Lee (who was a knockout, and whose efforts to remove bee from bosom caused 12-year-old males to gape)."

"With inflation, I bet they are worth $5 to $10 today. But from this perspective, that experience was priceless."

"The two-car garage is still structurally very sound (albeit lighter) after 75 years of providing nesting sites. What they do is akin to the 'honeycombing' used extensively in the aircraft and aerospace industry to lighten material. Try telling an aeronautical engineer that honeycombing is 'structural damage.' Carpenters bees simply are not a problem for structural integrity based on my experience."

"The female Carpenter bees keep a decent space between tunnels, preserving most of the strength. To this day, there is a ton or more of stuff stored on those cross beams. One reason for their thick gallery walls (3/16" or so) is to prevent parasitic wasps from ovipositing from the outside, and the Carpenter bees don't want to make their nest unsound either. They are *not* like termites, which eat everything and can cause buildings to collapse. Galleries also get reused."

"The biggest downside is a bit of sawdust on cars."

"I am pleased to say they are in my shed and my grape arbor, and my grandkids will appreciate them. I know that education cannot cure all apiphobia nor prevent needless application of pesticides, but I felt a need to make an attempt. Fairly benign measures are the badminton racquet (although mostly only hovering drones will be smashed but it does make a rewarding sound) and plastic or aluminum flashing to let worrywarts sleep at night. But even then, erect some bare untreated wood structures (trellis, arbors) to attract them away and to replace nesting sites for a very good pollinator, and enjoy them. They will be gone in a few months."

BIGGER PICTURE

Jessica **Louque**

How To Plan Your Garden

This past year, Bobby and I had a fairly prolific garden. It was so prolific, in fact, we wasted a lot of food (we are shamed like shaved alpacas). We spend a lot of time trying to organize the calendars to meet the crazy demands of our schedule and food can often be the last thing on the list. There are many times we come home from work and can't figure out what to make for dinner. We thought having a large garden would ease some of that, but it takes a lot of time to properly care for a garden, or just pick the things you want. Part of our problem was that our must-haves far outpaced what we actually wanted to eat, or had room to grow, or time to make.

In total, we had at least 18 different varieties of tomatoes of varying size, taste, texture, and usefulness. We purchased the artisan pack from Johnny's Seeds and one of my favorite tomatoes came from these – a Bumble Bee variety. Out of the seven varieties included, I only liked the Pink Bumble Bee. Now we have another 60 plants with tomatoes that nobody will eat. We had Sweet 100s, which were delicious, but there were *thousands* of them and they were so tiny! We had Wapsipinicon Peach tomatoes, which were really cool, but I couldn't get past the fuzzy. The Brandywines barely made it in the house with the Mister Stripeys and Zebras. Normally, German Johnsons are my favorite, but I didn't eat a single tomato sandwich this past year (shamed again). The most use we had from tomatoes was 20 Roma plants where we were able to make a delicious sauce out of the majority of the tomatoes.

We also tried a few other things. We had tons of beans, okra, squash, zucchini, and corn. Our blackberry vines from last year started to pan out with the first few fruits of their short existence. We had some that did awesome and some that did terrible, but now we can't find the tags that tell the variety. I think we wrote it down somewhere, and hopefully we can find it at some point. Our beans mostly went to waste because we didn't take care of them, but they were very pretty. The okra was barely touched, except for the last round that was pickled with some of the habanero peppers that pulled through their neglect. We had a ton of squash and zucchini, and we actually ate a lot of that. I cut it up and put it into pasta at least once a week (pasta is a staple), or cooked it with chicken, or sliced and eaten raw. We still have some in the freezer, but it seems a little freezer burned. This year was the first time we grew a lot of corn, and it was awesome. We had Trinity and Silver Queen, and they were glorious on the grill, or boiled, or even raw. It was delicious. We still had a lot leftover because we planted about a pound of corn seed. We also tried to grow some Glass Gem and Painted Mountain popcorn. It. Was. A. Waste. Don't get me wrong – they were pretty! They just weren't worth the effort to grow.

We had a rough time with our melons. They all grew to the size of large softballs, maybe slightly larger, then they either were eradicated by raccoons, or they contracted a disease. I think we might have eaten two of our mini watermelons that were almost too small to actually be considered a melon.

By comparison of our eating habits vs. garden habits, we did a crappy job. Of all the vegetables, the kids eat broccoli the most (weird, right?) and we didn't grow any. They love corn, but we had more than we could eat because we only did two succession plantings and should have planted at least three or four. We eat a lot of asparagus and actually had it planted, but it was only in the first year so we didn't have anything harvestable. Strawberries are a pretty big hit, but we did not have the first plant. The blackberries lasted exactly for the second that it took for someone to see a ripe one and then

Growing beans.

Bobby in the potatoes.

Bobby in the squash.

it was gone into the mouth of oblivion. Our edamame did terrible, but the kids love it so we will have to work on that one this year. We only used a couple heads of lettuce that were planted, but the rest of the year when we didn't have lettuce it seemed to be everyone's favorite. Our spinach went completely to waste, but then we were buying truckloads of it later in the year. Obviously, we need some work on our planning.

This Summer, start thinking about next Summer's plan. This year is the year of the Great Planning. Most of my resolutions this year revolved around better planning for the various aspects of our life together to make things a little easier and more organized. I hate wasting so much from the garden because it takes a lot of effort to grow, and it's so terrible to waste it and spend unnecessarily on additional food. I'm hoping my planning steps can be useful to other people who have issues with over-ordering or under-utilizing their gardening capabilities.

The first thing is to keep a food diary for your family to see what you eat. Not everything is important, but just having a record of the things you eat that you can grow is useful. This will not only give you a good idea of what you can grow, but how much you should be growing. If you are eating a salad once a week, then you could plant some lettuce and spinach, but just a little and staggered so that it would be ready every 10 days or so. If you like to make vegetable soup, you need to calculate how much of each vegetable you need to make one batch, then how many batches you plan to make. Let's say it takes you 30 Roma tomatoes to make the tomato base, a handful of basil leaves, a smidge of oregano and thyme, three ears of corn, four carrots, two potatoes, 30 pods of peas, 25 green beans, and one clove of garlic. You'd probably be better off buying the produce from the farmer's market or grocery store first and making a batch to see how many quart jars your recipe produces, and use that to determine how many jars you want to make.

The next thing you want to do is choose all the seeds you want, but categorize them into a few different sections. There's the "must have" section of the things that you know you will eat or you can't bear to not have in your garden. The next group would be the seeds that are for different purposes, like bee attractive flowers, or just flowers in general. Another division would be test crops that you haven't tried before, but want to make sure you can find it useful before you order a pound of seed. The last category would be the "I don't know what I would do with this, but I want it" section. If you have extra space, or you really want to grow it, but don't know what to do with it, or probably wouldn't eat it, then it should be here. For me, that would be cabbage because I think it's really pretty, but I hate to eat it and nobody here will touch it, except Bobby. Depending on your budget, you've now created an order to purchase the seeds from most important to least important (I know, they're all important, but you get the idea). A suggestion that I have for those extras is to drop them off at your local food pantry if you have time. I know ours appreciates fresh produce.

Now that you've chosen your seeds, you need to determine the exact amount of space you have available and what will grow best there. This should help you with the quantity of seeds you order, or to cut down in other places if you were having problems deciding what to order. We are doing something a little different this year with some broken bee boxes where we use them for planters. I think they will be really good for carrots, but Bobby is particularly excited about trying them out. We'll keep you posted on how that works. Planning the

Jessie in the corn.

The unloved Swiss chard.

space that you have is crucial to your working system because it can maximize the area if you have an idea of what to put together, or exactly how many plants you can fit in one area.

The last part is making a basic calendar of your gardening activities. This includes the overlap of cool season crops to Summer crops to Fall crops and onward, depending on your zone. You need to know how long you have to put up a small hoop house on your lettuce, estimated germination rates for your seeds to know when to start succession planting, when to add compost to your garden, expected harvest dates, etc. You also want to use this to consider your storage capabilities and see if you need to clear out freezer space, take a canning class, or maybe use this as an excuse to build a gigantic pantry, root cellar, and canned food area onto your house. You know, if you wanted. The point is, if you have a plan in place, you at least can see ahead of time what your schedule might be and where you could potentially have problems.

We're trying to keep ourselves in check this year to avoid waste and work that is not productive. There will still be some surprise additions to the group, and there will still be plants left by the wayside from neglect and sadness. Hopefully, we will be able to at least do a better job than last year and move in the right direction for next year. BC

Jessica Louque and her family are living off the land in North Carolina.

Letting some of the asparagus go to seed.

INNER ... Continued From Page 19

was released, EPA sent notice to every pesticide company that new registrations, repeat – new, of neonicotinoid chemicals would certainly be slowed, and perhaps denied. Within days of release EPA put a ban on spraying crops when they were in bloom. Wait…wasn't that the law before this went into place…do not apply to blooming plants? Maybe I misread that old label…but it does not address seed treatments with these chemicals.

At the end of the day, EPA was given, or submitted, a laundry list of things to accomplish to achieve their goals, summarized here:

- Assess risks posed by pesticides (completed in 2014)
- Document testing yet to do
- Complete honey bee exposure tests by the end of 2016
- Re-evaluate neonic registrations
- Evaluate soybean seed treatments
- Annually update risks and document labels that contain pollinator-specific mitigation measures
- Issue for public comment a proposed prohibition on foliar application during contracted pollinator services by Dec 2015
- Issue for public comment regarding the protection of monarchs that balances protection and weed management by summer 2015
- Document state/tribal pollinator protection plans for improved communication between grower/applicators and beekeepers
- Bee mortality incident guidance was issued May 9, 2013; EPA WILL REPORT ANNUALLY ON THE NUMBER OF REPORTED MORTALITY INCIDENTS, CUMULATIVE HIVE MOTRALITY, AND RESULTS OF INSPECTIONS (Yes, they will, if they receive those reports from beekeepers. That means you!)
- Document the time required to evaluate proposed new Varroa control products
- Document the number of varroacide products available for use

As far as the rest of the Strategy, how's all this going to get done? It's one thing to say it should happen, it's another to make it happen, the right way, on time, within budget. Well, there's an Action Plan. A list of how to meet those goals. It's long. Longer by far than the generic, glossy, fluffy Strategy everybody talks about. It is, in the old phrase, where the rubber meets the road. There are 10 topics, and each topic has a team leader and team. Here are the topics and the leaders:

- Status and trends, Terry Griswold, USDA-ARS, Jamie Strange (USDA-ARS), Jake Weltzin (USDA-USGS)
- Habitat (including stressors), Monica Tomosy (USDA-FS), Steve Hilburger (DOI-USGS)
- Nutrition, Gloria Hoffman (USDA-ARS), Mary Purcell-Miramontes (USDA-NIFA)
- Pollinator Pathogens and Pests, Jeff Pettis (USDA-ARS), Kevin Hackett (USDA-ARS)
- Pesticides and Toxins, David Epstein (USDA-OPMP), Anita Pease (EPA-0PP), Tom Steeger (EPA-OPP)
- Genetics, Breeding and Biology, Tom Rinderer (USDA-ARS), Bob Danka (USDA-ARS), Michelle Elekonich (NSF)
- Native Plant Development and Deployment, Jessica Wright (USDA-FS), Kas Dumroese (USDA-FS)
- Economics, Mark Jekanowski, (USDA-ERS), Jennifer Bond (USDA-ERS), Carl Shapiro (DOI-USGS)
- Collections and Infomatics, Gary Krupnick (SI)
- From research to application: models, tools and best practices, Mary Purcell-Miramontes (USDA-NIFA), Tom Moriarty (EPA-OPP)

Each of these topics has an essentially identical list of directions to follow. Though each will certainly contain different information, you can see the pattern and logic of their proposed work.

- Introduction/problem statement
- Key Priority Research Themes
- Existing/Current research
- Research gaps/needs and priority actions
- Other agency roles

You may recognize some of the leaders. Each leader's group has 6 – 10 members spread out over all of the 14+ agencies involved in the strategy, and some of these people are serving on more than one team, while some are leaders in one group, and team members in another. Moreover, there are timelines for these – and while some are ongoing and will essentially never be complete, some have definite endings, with five years being about average.

Atypically then, we have a list of what is to be done, who is to do it and when it will be done, plus a plan on reporting on a regular basis… annually or more often…how the work is progressing. Leeway is made for some projects proceeding faster than normal, and for some, as the research matures as they say, proceeding slower than anticipated, or perhaps abandoned for a variety of reasons. It seems, however, that any variation in this will show up in that annual report. Be sure to mark your calendars for this next May.

A quick aside is due here. One of the back-of-the-book attachments to all this was a list of the current Federal Pollinator Research projects going on at the moment. The list contains over 160 projects, what geographic region they are working, in (pacific NW, SW, N Plains, S Plains, MW, SE, NE, HI or international), what specific pollinator (honey bee, native bee, wasp, moth/butterfly, fly or vertebrate), and what the research plan was (Status and trends, habitat, nutrition, pesticides, native plants, collections, genetics, pathogens, decision tools, economics). The projects ranged from 'Systemic fipronil, thiamethoxam, and clothianidin effects on cell quality and function in amphibians, crayfish, and honey bees' being done in the SE, to, 'Creation of hi-resolution public domain photographs of native and introduced bees', across all regions, to, 'Antibiotic resistance in honey bee microbiota', being done in the S Plains, to, 'A synthesis of 55 years of research on the monarch butterfly', to, 'Olfactory processing and learning of complex scents in insects', to, 'A national survey of pesticides sampled from pollen in hives', to, a series of new surveys by NASS – quarterly, annual and cost of pollination', to, 'Insect pollinator response to removal of invasive shrubs', to, 'Improving forage conditions for honey bees and native pollinators on USDA Conservations lands. And the list goes on and on… over 160 projects at the moment. You can't say the government is standing still, can you. But enough of this . . .

Because we're not done. There's another document that goes with all this. The Appendix. It, like the ac-

tion plan is long. Much longer and in more detail that the others…I suppose if they put it all in one, no one would ever get through it, so they break it into pieces…complicated, less complicated, lists, even less complicated, time line, budgets, and who and how. Or something like that.

Each Agency had to submit their very own Pollinator Protection Plan. What they specifically will do, who they will call on to help, how they will do it, and when it will be done. This is really the rubber hitting the road..it's different that the rest of the plans. Much, much more specific. I think this is the real thing . . .

EPA has a lot on its plate for this project. The opening paragraph says it all: The EPA was directed to assess the effect of pesticides, including neonicotinoid insecticides, on the health of bees and other pollinators and to take appropriate actions to protect pollinators. They were directed to engage state and tribal agricultural and environmental agencies to develop pollinator protection plans. They were directed to encourage the incorporation of pollinator protection and habitat planting activities into green infrastructure and superfund projects and to expedite the review and registration of new products targeting pests harmful to pollinators.

They have a 2017 deadline to complete the neonic studies and evaluations, a 2015 timeline to release the list of 60+ other pesticides commonly used, and will provide annual updates on the number of pesticides for which the new risk assessments have been incorporated, label upgrades are listed, but from where I sit the language is cloudy in how and when that is to occur, but they are considering up to 50 different active ingredients – somehow – the metric for this states that – the need for each plan to identify metrics for measuring their effectiveness in reducing honey bee losses. To me this means there needs to be a baseline before they measure the effectiveness of the changes implemented. They are also supposed to upgrade the Seed Treatment Stewardship Guide before the 2015 planting season, which is essentially over before this was released. Darn. They also are to develop BMPs for growers/beekeepers relative to crop pest control, in conjunction with USDA. They are also measuring the time it takes to get new Varroa controls registered…compared to what I'm not sure, but they use this to gauge their progress. They also must evaluate superfund sites for habitat and look at monarch protection, in balance with weed management by this summer. Just about 25% of all of the goals have landed on EPAs desk. Let's hope they get enough money to do the job.

Although each department was instructed to develop their own Pollinator Protection Plan, space here says that we'll look at USDAs and call it a day for now. Some of these are what I would consider gimmes, but they do have value. Document federally owned pollinator gardens is one. But then, working closely with stakeholders they will prioritize work plans, publish new information rapidly, and develop and release new patents. Working with EPA they have helped 5 states develop pollinator protection plans, and are working with 20 more. That looks like they have lots yet to do… and I wonder how cooperative the states will be? And who's at fault if, say, Ohio decides it doesn't want to spend the money to do that? Already USDA has increased CRP land, and plans on doing more, along with improving the habitat that's already there. FSA and NRCS have a lot on their plate for this, and it's all supposed to happen in 2015. That was a no-brainer, but it's good to see.

There's more of course, DOD comes down to: The DOD will, subject to funding, report annually on habitat improvement acreage for this. The key word here…funding. The Dept of Education will do gardens, newsletters and web pages. Dept of Energy will increase acres of land available at certain sites, develop and BMP for doing so, all over 10 years, resources permitting.

The Dept of Interior has a lot of monarchs on its watch, but in 2015 they will develop educational material for the public, get a new web site, distribute seeds, fund at least 20 pollinator projects in 2015-16, work with Federal Parks and in turn all of the people who visit the parks. FWS and BLM are generally working to increase pollinator friendly land, and the plants planted on that land including mine sites, forests, rights of way and more. Developing seed mixes to use on these is important as is storage and developing banks.

The State Dept will develop pollinator friendly gardens and lands where ever they happen to be. This is the international scope of this program. The Dept of Transportation will reduce pesticide use on rights of way, adding flowering plants to their respective lands, and work with OSSM to develop the I-35 Corridor for the monarch flyway, a great idea I think.

There's still more. HUD, GSA, US Army Corps of Engineers, National Science Foundation (which funds a great deal of research, lots of it at the grad student level), the Smithsonian Institution, and finally FEMA (who knew they knew about pollinators?).

A lot went into all of this. I'm impressed with the thoroughness of the coverage, how inclusive it is within each department, and the lofty goals. Will all, any, some, none of it get done? And the question remains – who's in charge? The President that started all this will be gone in a couple of years, and many of the timelines for this project extend past that time. Moreover, many, if not most of those that are to be done before that date extend the caution of 'available resources'. Money is the driver here – an additional $34 million for a total of $80+ million available to make this happen. And that's year one.

We all know what the future holds if these actions aren't taken at the Federal and State level. Bees, monarchs and all the rest of us can't wait much longer.

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Celebrate the Fourth of July this month for the reasons it was meant to be celebrated. We live in a good place, and the work described here, as good as it is, and as bad as it is, is better than almost anywhere else. And keep your veil tight, your smoker lit and your hive tool handy.

2016 CALENDAR PHOTO CONTEST

Our 2016 Calendar Photo contest is going to be very different from years past. We've had bees on flowers, and beeyards, and beekeeping through the seasons and of course this year's Bees And Water. This time, it's Every Thing and Any Thing Honey Bees!

Everything means just that…bees and flowers, beeyards, beekeepers, working bees, bee products, selling honey, bees up close and personal on landing boards, on frames, drones, workers, queens, swarms, swarming, shaking packages, installing packages, making industrial splits, bees on trucks, in cars, bee beards…Everything and Anything Honey Bees. Use your imagination, your instincts and your beekeeping experience and skills and get out your camera and start shooting

THIS IS IMPORTANT. Submit your photos as a jpg file, attached to an email, not embedded in the email. Send one photo per email, and include WITH EACH EMAIL YOUR NAME, ADDRESS AND PHONE NUMBER. We got over a thousand photos this year and keeping them all straight when they are not identified gets to be a real difficult task – and there aren't many of us here to do that. If it isn't identified, it won't get looked at, so please label each.

If you send a CD with photos, write ON THE CD (NOT ON THE ENVELOPE OR BOX) YOUR NAME, ADDRESS AND PHONE NUMBER AND EMAIL. The same rules apply – no information, it won't get looked at. We're sorry, but we just don't have the time or people to organize a lot of photos and try and keep them all straight if they are not identified. Make it easy for us and you stand a much better chance of getting your shot in the calendar.

Deadline for submissions for Bee Culture's 2016 calendar is October 1, 2015 in our office. So mark your calendars now (OH, look! It's already marked on your 2015 Calendar and a month earlier!) and get going. Once entered, photos can be used by Bee Culture magazine.

As usual, send your photos as jpgs to me at Kim@BeeCulture.com, with 2016 Calendar in the subject line. FOR EVERY PHOTO (1 PER EMAIL) include your name, email, phone and address. If you don't we can't use the photo.

Thanks for making this easy for us, and for a good calendar. Good Luck!

GLEANINGS

JULY 2015 • ALL THE NEWS THAT FITS

EPA PLANS TEMPORARY PESTICIDE RESTRICTIONS WHILE BEES FEED

A federal rule to be proposed Thursday would create temporary pesticide-free zones when certain plants are in bloom around bees that are trucked from farm to farm by professional beekeepers, which are the majority of honeybees in the U.S. The pesticide halt would only happen during the time the flower is in bloom and the bees are there, and only on the property where the bees are working, not neighboring land.

The rule applies to virtually all insecticides, more than 1,000 products involving 76 different chemical compounds, said Jim Jones, EPA's assistant administrator for chemical safety and pollution prevention. It involves nearly all pesticides, including the much-debated class of pesticides called neonicotinoids, he said.

The idea is "to create greater space between chemicals that are toxic to bees and the bees," Jones told The Associated Press.

This is part of a new multi-part push by the Obama administration to try to reverse dramatic declines in bee populations. A new federal survey found beekeepers lost more than 40 percent of their colonies last year, although they later recovered by dividing surviving hives.

Scientists blame many factors for bee declines: pesticides, parasites, pathogens and poor bee nutrition because of a lack of wild plants that bees use as food. The new rule only deals with the pesticide part; last week, the federal government came up with a plan to create more and varied food for bees on federal land.

The new rule "doesn't eliminate (pesticide) exposure to honey bees, but it should reduce it," said University of IL entomologist May Berenbaum. "It may not be ideal, but it's the best news in about 120 years. In concept, in principle, this is a big policy change."

The EPA proposal doesn't apply to residential pesticide use, nor home beekeeping. This is just for areas where professional beekeepers haul in their hives. These trucked-around hives now account for about 90 percent of honeybees in the U.S., according to the University of Maryland's Dennis van Englesdorp.

This method of managed hives is the insect equivalent of handling livestock and is "a fairly intensive process," said Pennsylvania State University professor Diana Cox-Foster. "I think it's much more work than raising cows."

Jones estimates that at least 2 or 2.5 million acres of cropland will be affected by the new rule. It only applies to spraying pesticides on leaves, not seed or ground applications.

"The acreage may not be large, but the impact is," Jones said. "It's really a function of where the bees are." So when bees are pollinating almonds in February and March, the temporary bans would be near almond trees. They would apply near apple trees in April and May and melons in late Spring, he said.

The rule is focused on the time when scientists can document the highest risk for bees, Jones said.

The proposal needs public comment, then will be finalized. If all goes according to plan, new rules and new pesticide labels will be ready for Spring 2016, Jones said.

If You Don't Have A Seat At The Table You're Probably On The Menu

POLLINATOR PARTNERSHIP HELPS FUND HONEY BEE RESEARCH

There will be a few more busy researchers gearing up for the 2015 season thanks to support from Pollinator Partnership's (P2) generous donors who helped generate more than $60,000 for honey bee health issues. With funding from USDA APHIS as well as contributions from individuals. "This fits perfectly with the recently announced federal strategy for honey bee health announced by President Obama," said P2 Exec. Director Laurie Davie Adams. "This public-private partnership is exactly what is called for." See **www.whitehouse.gov/blog/2015/05/19/announcing-new-steps-promote-pollinator-health** to view the federal strategy.

The Honey Bee Heath Task Force of the North American Pollinator Protection Campaign, under the co-chairmanship of Christina Grozinger, PA State Univ, and Robyn Rose, USDA APHIS, solicits proposals each year in January from University researchers and graduate students who are pioneering new approaches to bee nutrition, conservation, genetics, and epidemiology.

"Researchers today are dealing with more and more complicated questions and scenarios in bee health. Honey Bee Health grants help give pioneering researchers the flexibility to ask additional questions and have sparked some remarkable findings," offers P2 Research Director Vicki Wojcik.

This year the NAPPC Honey Bee Health Task Force assembled a distinguished panel to review the proposals which included Jeff Pettis, Ph.D., John Skinner, Ph.D., Olav Rueppel. Ph. D., Laurie Davies Adams, Kelly Rourke, Robyn Rose, Ph.D., and Deborah Delaney, Ph. D. The panel funded six outstanding research projects that advance the science supporting practical applications in genetics, pesticides, nutrition, best management practices, pathogens and pests. Of the more than 50 applications submitted to the NAPPC Task Force, the following projects will be funded and will report progress at the annual NAPPC International Conference in Washington, DC October 20, 2015:

•Diana Cox-Foster, PA State Univ will be studying the antiviral immune responses of honey bees, including whether bees are able to change their behaviors and self-medicate to avoid or reduce infections.

•Adam Dolezal, IA State Univ will be investigating how infections with viruses might change the behavior of honey bees and perhaps increase their transmission.

•Research into how a full range of pesticides impact bee health will be conducted by Scott McArt, Cornell Univ.

•Graduate researcher Rodney T. Richardson, OH State Univ will be looking into the immune functions of honey bees in response to fumagillin – a commonly used antibiotic in beehives.

•Veterinarian Elemir Simko, Univ of Saskatchewan will be testing the impacts of the neonicotinoid imidacloprid on worker bee development and hygienic behavior.

•Dennis vanEngelsdorp, Univ of MD will be looking into the real world impacts of the multitude of pesticides that honey bees interact with as well as their diet to better understand total bee health.

Funding for the 2015 Honey Bee Health grants came from a research partnership with the USDA and APHIS as well as generous donations from individuals through P2's Bee Merry and Bee Mine campaign. Honey Bee Health Grants have been distributed for over five years, totally more than $300,000 in research support for over 30 research programs in Canada, the U.S., and Mexico. Funding falls short every year and tax-deductible donations are welcomed throughout the year. One 4th grade classroom had a bake sale for honey bee research and contributed over $400. Every dollar received is leveraged significantly and makes a real difference for honey bees. Contact Kelly Rourke at Pollinator Partnership at **KR@pollinator.org**, 415.362.1137 to join the campaign.

CALENDAR

♦COLORADO♦

The CO State Beekeepers Association will host the Western Apicultural Society conference in Boulder October 1-3.

For details visit **www.ucanr.edu/sites/was2**.

♦CONNECTICUT♦

Back Yard Beekeepers Association 2015 Speaker Schedule – September 29, Sam Comfort subject TBD; October 27, Juliana Rangel Posada on the Reproductive Biology of Honey Bees; November 17, Michael Fairbrother of Moon Light Meadery on Mead.

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

♦IOWA♦

IA Honey Producers Association Field Day will be held July 11 at Lynnville. Linville bank and Phil Ebert's residence weather permitting.

Leo Sharashkin from Missouri will be the speaker.

For information visit www.abuzzaboutbees.com or contact Roy Kraft, 515.293.2458, **Kroyster.rk@gmail.com**.

♦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**.

♦OHIO♦

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

September - Phil Craft

October - Dave Duncan and Ellen Harnish

For information visit **www.medinabeekeepers.com**.

East Central OH Beekeepers Conference will be held at F.O. E. 302 1275 E Market Street, Zanesville, September 19. Registration starts at 8:00 a.m.

Pre-register at **www.e-coba.org**. Cost is $40/person, $50 at the door. Lunch for $8.00.

Speakers – Tammy Horn, Jennifer Berry and Ed Karle.

♦OREGON♦

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

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

For information contact Sharon Schmidt, **oregonhoneyfestival@outlook.com** or 541.951.5595.

♦PENNSYLVANIA♦

Delaware Valley College will hold Beginners classes July 10-12, $190/person. Both classes will be held at the Main Campus, Feldman Building, 122.

The instructor is Vincent Aloyo. Bring a lunch, veil, three-ring-binder and dress appropriately for the beeyard.

For information and to register **delval.edu/non-credit**.

♦SOUTH CAROLINA♦

SC Beekeepers Association will hold their Summer Conference July 23-25 at Clemson Univeristy at Hendrix Hall.

Speakers include Phil Craft and Dwight Wells.

For information visit **www.scstatebeekeepers.org**.

IBRA

INTERNATIONAL BEE RESEARCH ASSOCIATION

As of May 1, 2015 the Registered Address of the International Bee Research Association will be –

Hendel House
Hendel Hill
Groombridge
East Sussex, TN3 9NT
United Kingdom

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The friendly UPS associate in Indonesia solemnly informed me, "I have launched an investigation into the disappearance of your queen bees! You will hear back within eight business days!"

The top of my head came right off. "Eight days!" I shouted into the phone. "My honey bees will be dead by then!" I shouldn't have come unglued like that. It wasn't her fault. It was mine, for agreeing to overnight shipment late in the week, with no weekend delivery to back up a delay, which you should always expect.

The little darlings arrived in Glenwood Springs, Colorado on Monday, where I picked them up. They'd spent the weekend in Ontario, California, reason unknown. They looked fine, but I never got to use them.

That same weekend I learned that Aunt Gert passed away at nearly 100 in Montana, the last of her generation. This did not occur at a convenient time for me. Still, I had to go. But as Paul pointed out in a phone conversation, "If you have to go to a funeral, Montana's not a bad place."

Indeed. That place of all places remains pregnant with childhood memories. And I'm related to most people in the Treasure State.

Well, what about those queens that finally arrived? I already owed Paul either money or queens for queens he gave to me earlier in the spring, so I gave him this latest batch and never saw them again.

Before we left for Montana, I had to make a whirlwind trip over the Continental Divide to meet with my *Bee Culture* editor Kim, at Tom Theobald's house in Niwot, Colorado. I lost fourth gear in my '91 Saab 900S coming down off Vail Pass. I learned to shift from third gear straight to fifth, before I got lost in Boulder. I still made it to Niwot in time for a late breakfast, although by that time Tom and Kim were famished, and wondering.

Kim asked what my *Varroa* mite treatment threshold for a 300-bee sugar shake sample was, and I said, "Well, in February, it would be one mite." Mites double their numbers every month, at least, so that would be 32 mites in July. That's way too many!

Kim replied that he knew a guy who treated his bees any time of the year that they had one mite per sample, allowing that that guy didn't produce honey. (So he didn't have to worry about contaminating it with acaricides.)

I think that's going a little overboard. We have to accept that we live with mites. We need to be responsible guardians of honey bees, but we also need to let it go and sleep at night, too. Constantly dealing with *Varroa* is simply a normal part of modern beekeeping. We're not going to eradicate them.

If you've been at this game for awhile, you remember when American Foulbrood (AFB) was the beekeeper's curse. I had six AFB cases in my hundred-odd colonies last year. I treated with the antibiotic tylosin, with the intention of shaking these bees onto new foundation this Spring. My AFB symptoms cleared right up, but these colonies dwindled through the Fall, and I kept combining them, until finally I had only one. In April, I opened that hive to requeen. I saw seven frames of bees, with the bees split into one cluster of three frames and one of four, with an empty frame or two between. Sure enough, two queens, two colonies, living under the same roof, using the same entrance. Those AFB-tolerant queens got dispatched to a better place, the two colonies now united under a new, hopefully more disease-resistant queen.

I used flax oil to introduce some of my queens this year. I got this idea some years back when Michael Breed from the University of Colorado gave a talk to the Colorado beekeepers. But I never tried it until now. Flax oil contains many of the same fatty acids found in beeswax. I put a paper towel with a little flax oil on it into a queen box full of queens and attendants, in hopes that the queens might stink like flax when I put them into their waiting hives. Ditto for the hives themselves. So all the bees now stink like flax, and the new queen smells like an old friend, not a new foe. I left the flax oil in the queen box for several days prior to queen introduction into the hives. I put the oil into the hives when I removed the old queens or made my splits or nucs, i.e. 24 hours before new queen introduction. I released these queens the easy way – by allowing the bees to eat through the queen cages' candy plugs to release Her Royal Highnesses. The results: ten of 12 queens accepted, about what I'd expect without using the flax. I was looking for something more dramatic – say, 100 percent acceptance.

You can eat flax oil and probably should. You'll find it at your local health food store. It contains the omega-3 oils that help to keep down your cholesterol. It startled me to learn that flax oil is also called linseed oil, the stuff you use to stain redwood decks, and which I always assumed would kill you if you drank it. I told my gal Marilyn, "Why don't you stain the deck, and if you get hungry, you can nip on the linseed oil." She found this hilarious. We're easily entertained here at Colby Farm.

I probably won't bother using my bottle of flax oil again for introducing queens. I'll eat it, instead. My cholesterol's a little high.

Ed **Colby**

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