

BEGINNER'S QUESTIONS - 63

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Bee Culture

The Magazine Of American Beekeeping

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City Manners - 65**

**All About
Italians - 23**

**Mints Make Great
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Lots to do about Queens, especially Italian Queens this month. Larry Connor raises them, Ross Conrad shows what can go wrong and how to tell, and John Phipps has the whole story on how they got from there to here.

Randall Swartz photo

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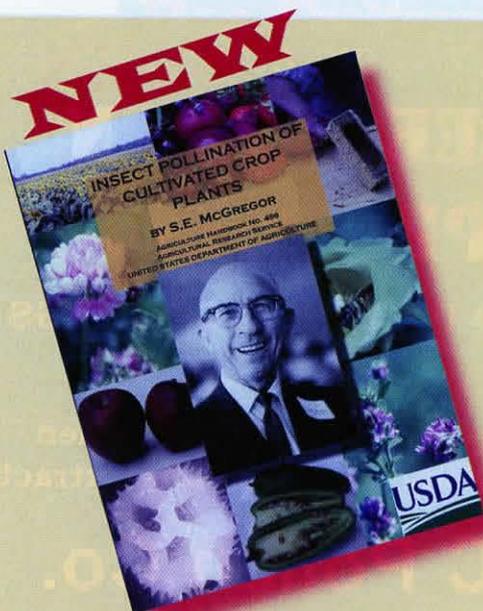
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Insect Pollination OF Cultivated Crop Plants

By S. E. McGregor

Agriculture Handbook No. 496

First published in 1976 by ARS USDA, Republished in its entirety, 2011, by The A. I. Root Company

411 pages, Soft Cover, black and white throughout. More than 240 photos and drawings, 15 comprehensive tables.

ISBN 978-0-9846915-0-0. \$34.95

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More About Rossman

This paragraph was supposed to be at the end of my article in the February issue.

"For almost 60 years Rossman Apiaries has supplied beekeepers, from the commercial to the backyarder, products that have kept this industry humming. There have been some hurdles along the way but thankfully, they never quit. Fred and Ann have been great friends to me, as well as the UGA Bee Lab and beekeepers in general. They have been extremely generous with their time and resources. It was a great day when Fred received "Beekeeper of the Year" from the Georgia Beekeepers Association. When I heard the news my first thought was, "FINALLY!" It was certainly overdue."

Jennifer Berry
Comer, GA

Young Beekeeper Award

The average beekeeping club appears to have many more members over 50 years old than they have members under 20. Our club in upstate New York, the Southern Adirondack Beekeepers Association (SABA), has found a successful way to help young people who have an interest in beekeeping get started.

At the 2004 meeting of the American Beekeeping Federation, one of our SABA members heard

John Talbet of Texas give a presentation about his state's youth beekeeper award. The objective of this annual award is to introduce and educate young people in the art and science of beekeeping. A home-schooled teen named Blake Shook won the award, and Mr. Talbet was his mentor. Blake has since gone on to become Texas' youngest commercial beekeeper (<http://desertcreekhoney.com/>).

The 2004 presentation was the incentive for SABA to institute our own annual youth award beginning in 2005, the Wolf-Lounsbury Young Beekeeper Award. With funding from SABA members and other organizational funds, the award fully outfits the winner with a starter beehive, bees,



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Suggestions
Comments

equipment, protective gear, club membership, book, class, and a mentor (a \$450 value). Starting in 2011 SABA is now able to present a second annual young beekeeper award, the Bob Stevens Youth Beekeeping Award, thanks to sponsorship by Betterbee Inc., a local beekeeper's supply company.

The young beekeeper award at the community level is an excellent way to grow your club membership and encourage youth to participate in the joys of beekeeping. Additional information about the awards is available at the SABA website, www.adirondackbees.org.

In the photo are 2011 Young Beekeeper Award winners Martha Berben and Brian Pruskowski

David Wood
NY

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FILTERED HONEY IS HONEY ULTRAFILTERED HONEY IS NOT

A Reponse to The Andrew Schneider Article in Food Safety News

From The National Honey Board

The November, 2011, *Food Safety News* story on honey may have led readers to believe that any honey without pollen is not real honey. This is not true. (Read the story at www.foodsafetynews.com/2011/11/tests-show-most-store-honey-isn't-honey.)

According to the United States Standards, honey can be filtered to remove fine particles, pollen grains, air bubbles and other materials found suspended in the honey¹. In fact, the U.S. Department of Agriculture gives higher grades for honey that has good clarity. Importantly, honey that has been filtered to meet USDA's grading standards may not have pollen, but it is still honey.

Honey is filtered by U.S. packers for various reasons:

1. Many consumers prefer honey that is liquid and stays liquid for a long time.

- All honey crystallizes eventually. Suspended particles and fine air bubbles in honey contribute to faster crystallization. Filtering helps delay crystallization, helping the honey to remain liquid for a much longer period than unfiltered honey.

2. Many consumers prefer honey to be clear and brilliantly transparent.

- The presence of fine, suspended material (pollen grains, wax, etc.) and air bubbles results in a cloudy appearance that can detract from the appearance. Filtering is done to give a clear brilliant product desired by consumers. For the filtered style of honey, USDA Grading Standards for Extracted Honey give higher grades for honey that has good clarity.
- Honey is filtered to remove extraneous solids that remain after the initial raw processing by the beekeeper.

In contrast to the filtration

methods used to meet USDA grading standards, ultrafiltration is a more complex process that results in a sweetener product. The FDA says this product should not be labeled honey. The article (in *Food Safety News*) confuses filtration and ultrafiltration, applying FDA's position on ultrafiltered honey to any honey without pollen. The fact is filtered honey may not have pollen, but it is still honey by national standards and is preferred by many consumers.

We are all concerned about illegal activities that negatively impact the honey industry, damage the image of honey, or cheat consumers. We support the U.S. Food and Drug Administration in its regulation of honey and oppose any practice that would jeopardize the quality, purity and image of honey.

However, the misunderstanding about ultrafiltration has misinformed consumers. Here's what consumers need to know:

- **Filtered honey** is honey produced to meet national standards. Filtration removes floating particles, and sometimes pollen, and keeps the honey liquid longer and improves clarity.
- **Ultrafiltration** produces a sweetener that should not be called honey.
- Honey bees make honey from nectar, not pollen.

¹For decades, many U.S. honey packers have been filtering raw honey prior to bottling in accordance with USDA's United States Standards for Grades of Extracted Honey (May 23, 1985). According to section 52-1393 of the Standards, Filtered honey is honey of any type defined in these standards that has been filtered to the extent that all or most of the fine particles, pollen grains, air bubbles, or other materials normally found in suspension, have been removed. Section 52.1394 of the Standards also says that Pollen grains in suspension contribute to the lack of clarity in filtered style.

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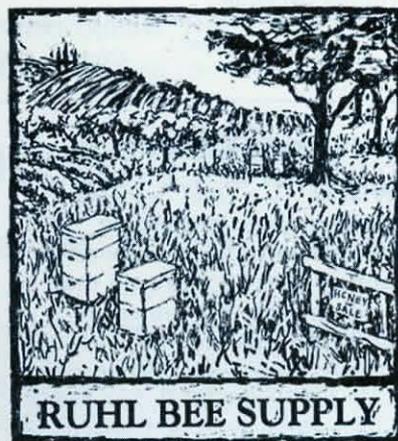
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Pesticides Kill

Your December issue featured an editorial about a Pennsylvania beekeeper that had 200 colonies killed due to the misapplication of pesticides. The same thing happened to me in Utah. I am a commercial beekeeper in Montrose, CO. I have provided pollination for the melon farmers in Green River, UT for five years. For the 2011 season I placed bees in 17 locations to pollinate the melons grown there. Within a week after a pesticide fogging application by the county weed and mosquito department, I noticed that my bees were dying by the hundreds of thousands. The ground around many of the colonies was covered with dead bees. It looked like brown gravel. A stench of death filled the air from the decaying bodies of the dead bees.

At least 230 of my colonies were killed. The bees were working blooming fields of melons, squash and pumpkins. My phone number was clearly posted on the hives, so a simple call would have provided me the opportunity to move the bees prior to pesticide application. A Utah Pesticide Enforcement official told me that Utah has no legal requirement to notify beekeepers prior to pesticide application in areas where bees are working. He also stated that manufacturer product label warnings can be disregarded

when human health and safety is at risk.

The true risk to human health and safety is from pesticides, not insects. This risk became abundantly clear when my wife and I loaded our son into the hearse that took him away at the end of his courageous battle with the lymphoma that killed him at 28. The incidence of lymphoma in young people on the Western Slope of Colorado far exceeds the average for the state of Colorado. Oncologists and other cancer experts are beginning to think it may be due to the high level of pesticides applied to our local crops.

In the article you wrote about the total economic loss to the agricultural community. It is certain the farmers and other citizens of Green River will feel the economic blow of reduced income because the bees won't be there to pollinate the



melons this season. I am feeling the economic devastation of the cost to replace the bees, and the lost pollination fee income, as I have no bees to take to CA for the almond pollination. And, there is the honey crop that won't be produced this Summer, a significant component of my income, and the income of local vendors.

And yet, the economic loss pales when it is our sons and daughters that are lost due to the pervasive use of pesticides across the country. Some of the locals in Green River mentioned to me that they could smell the spray in their homes at night. Children, parents and grandparents were all breathing this poison.

To my fellow beekeepers, I urge you to make yourself aware of the pesticide regulations and practices wherever you may place your bees. And to my fellow humans, I implore you to learn more about how pesticides are killing more than just bugs.

Darcy & Don Arnold
Montrose, CO

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INNER COVER

It's late February, early March right now and California's Almond Odyssey is running full speed. Of course I said I'd be reporting on this already, but it's the end of January – I'm not even there yet! I think this is future tense or something – but there is some present tense information about this event, background stuff, that will be helpful later.

One of the first places we'll be visiting is Paramount Farming in Bakersfield. They are part of a much, much larger company that, among other things sells bottled water from Fiji and is a strong supporter of the arts in the Los Angeles area. Paramount Farming

is only one, a big one, but only one part of the operation. They are the production part of the business that grows the almonds, the pomegranates (these are the folks who produce POM Wonderful), the citrus (seedless nectarines are only one of the varieties they grow) and pistachios, among other crops.

Pomegranates and almonds need bees for pollination, pistachios don't, and seedless nectarines absolutely don't want bees. In fact when the nectarine crop is in bloom the trees are covered with netting to keep bees out. The nectarines were planted too close to other citrus trees – navel oranges and such – and when pollen from one of those is transported to the nectarine blossoms you get seeds in what should be a seedless nectarine. What you have then is a tangerine loaded with seeds. Delicious, larger, and in my opinion better tasting, but loaded with seeds which lowers the value of the crop – so, they keep the bees out.

Gordy was brought in to oversee the growing bee business at Paramount Farming. Almonds are a big part of that. Chew on this for a bit – they rent 92,000 colonies this year for their 46,000 acres of almonds. Using Almond Board figures, that's 5.7 million trees to take care of that will produce about 46,000 TONS of harvestable crop.

I was talking to one of the beekeepers they work with and he made the comment about the prices for colony rental – if you rent colonies for a living you'll appreciate this, and if you don't yet, think of this – if Paramount Farming raises the price for colony rental – say a buck a colony – it costs them almost \$100,000 – boom, right now. Still, that's less than 1% of their pollination rental costs. Almonds are the biggest crop in the state so you'd think beekeepers would get a better deal at the border, wouldn't you?

Gordy also is looking at using solitary bees for almond pollination. His trials are preliminary yet, and there are other growers looking at them too, so hedging bets on honey bees is on the table. That would be a good business decision I think. Speaking of hedging, there is an almond breeder who has produced an almond variety that is self fertile and doesn't need honey bee pollination. Recall, almond blossoms, like apples, need pollen from a different variety of almond blossom to set seed and produce fruit. Almond orchards are planted so that different varieties are very near each other, so everybody gets a good chance to get visited. Every blossom produces an almond is the goal.

Paramount Farming is also looking into supplying before and after pollination forage for visiting beekeepers. Take care of the beekeepers that take care of you can only be good business. This is still in the planning stages I'm told, but it's on the horizon. Maybe by next year they'll be a Bee Friendly Farm.

One more thing. We're going to visit with the CEO of Blue Diamond – a household name when it comes to almonds and other crops. Think of this – the supply of almonds continues to grow, the demand continues to grow, and the price continues to grow. This pretty much defies explanation, logic

and common business sense. But it works for almonds. It's magic as far as I can tell – and a story the honey industry might learn from. We'll find out how they make it work – stay tuned.

There's an old saying, or there should be an old saying if there isn't one that goes – the more insurance you buy to protect yourself from some disastrous event the less likely you will find yourself needing it. Of course the extreme for this would be to buy 20 bazillion dollars worth of life insurance – you'd live forever.

But, not having heard this old saying before, this past Autumn I prepared for a long, hard Winter. After all, the Farmer's Almanac warned of monstrous storms, snow and rain beyond imagination, and in all likelihood the end of the world as we knew it, at least in my part of northeast Ohio. Snow, more snow, cold, colder, coldest ever was the prediction. Plus, the black band on the woolly bear caterpillar was almost as wide as those caterpillars were long, the acorns were inches thick on the ground, and the fruit from our Osage Orange trees were the biggest I've seen in more than 20 years. Surely we were all going to die.

So I did two things to prepare. I buttoned up the bees better than ever before. Double wrapped, insulated covers with extra ventilation, screened bottoms closed all the way for the first time ever, front doors reduced to a bee space, and more food left on than ever before, and even some added just to make sure. Those bees were prepared for arctic conditions that would last months and months. Those colonies were tough, rough and ready.

And then, when the bees were ready, I bought some new boots. I pretty well manage most anything

Almonds.
Winter.
Varietal Honey.

with my Red Wing work boots. I've been a steady user for more than 40 years. I always have two pair going – a new pair that I wear for everyday and an older pair that get to go to work – bees, gardening, dirty-work stuff. When the old pair finally wears out I get a new pair and the by-now-broke-in pair gets to start working for a living. From brand new to finally gone, a pair lasts me between seven and eight years. I get my money's worth.

But leather boots, as comfortable and wearable and versatile as they are require regular maintenance – oiling, stretching, replacing worn heels, more oiling – a couple times a month in the Winter, at least that much or more in the Summer mud.

So, because this Winter was supposed to be nothing but wet, cold and more wet, I went out and bought a pair of those extra special, rubber on the bottom half, leather on the top half, insulated, water proof, high-top, supposed to last forever Winter boots that cost a month's wages but look very, very cool. I was going to be warm, dry and fashionable.

Well, Winter may still come this way this year. But by the end of January it had pretty much missed us altogether. Warm it was, somewhat wet – rainy wet, but not enough snow to track a cat for more than a day at a time, and then only a couple times. Bummer. The experts, of course, talk of El Nino, a polar cap something that didn't go where it was supposed to go, or was late, or was not doing what it should have been doing, all Winter long.

And even if it tries to be Winter again, it won't be much and it won't last long (he says with confidence). And since I was gone most of last month – that would be February – by the time I get back it'll be time to unwrap those overfed, over protected colonies and get them, and me, back to work – in a pair of good old leather work boots. So much for the Winter of 2012.

I wonder what would've happened if I'd bought that snow blower I was looking at back in August . . .

When you know, or are reasonably certain that you have harvested a mostly pure varietal honey – for instance, you watched blossoms, timed the bloom, measured the grow-

ing degree days and PRESTO!, right on time the Black Locust bloomed and bloomed and bloomed – and you had only empty supers on and it didn't rain, and the minute the first blossom cluster started to wither you moved those supers off as fast as you could. And then, back in the garage, when you took the cover off that stack of harvested supers the aroma was even more overwhelming than when standing in that locust grove where your bees had just spent the last 10 days...well, then you can do some wonderful marketing adventures.

Start with – a top label that says – Pure Ohio Black Locust Honey (well, yours probably won't say Ohio, but you see what I mean). Make it a colored lable – say medium green, and reverse out the type – make it white, like the flowers. If you have the chance, outline the locust leaf on the edges – in black – just to stand out more.

If you don't have a front label for just locust, put a smaller label, just like the one on top, on the front, toward the top, on the left side – it gets noticed a lot more there – so it doesn't cover anything important, but just touches and overlaps one edge of the main label. It'll stick out if you do it that way. Heck, use one even if your front label already says it's locust. Make it the same color as the top label. In fact, make all your varietal labels a color, a different color for each variety of course, and dark enough to stand out and make the white copy easy to read.

If you can, add a hang tag with a recipe or two made just for locust honey – something that needs a bit of flavor – locust makes great sauces, spreads, compotes and salad dressings because it has that nice tangy ending no matter what you mix it with. Heat it in a recipe though, and that tang disappears. You might suggest trying a simple tasting with it – it goes great with a smooth, creamy cheese so they don't compete, or try it with a flavored cracker – something without a lot of salt so the sweetness doesn't get covered up. And wash it down with a smooth, white wine. Not tart and never red. If a hang tag doesn't work send along a half sheet of thick, colored paper with the same information on it ~ anything with color and weight tends to not get discarded or lost in the bottom of a purse. And a colored ink helps.

And this is just a start. Think of what you can do with the labels, the recipes and the, and here's the interesting part – the price. Because, you know, you worked hard for this, and you have all that investment in labels. And this stuff is special – look, it's got two extra labels, recipes – \$10 a pound for sure.

It's March, folks. Those locust trees will be blooming any day now – the new hardiness zone map says so. Get out your hive tool, get your smoker lit, and patch up that veil – it's time to keep bees, full speed.

Ken Hoffman

Tuscan Honey Festival

What: Settimana del Miele - Honey Festival

When: 9-10-11 September 2012

Where: Montalcino, The City of Honey

Who: Beekeepers of Siena, Grosseto & Arezzo, Apicoltori Siena Grosseto Arezzo

www.asgamontalcino.com/home.html



Attend the 3 day Honey Festival, taste more than 50 varietals of honeys produced in this region, shop Italian beekeeping supplies. Italian cooking classes with cookbook author Chef Pamela Sheldon Johns at her B&B Poggio Etrusco www.poggio-etrusco.com/ Montepulciano, visit local apiaries, vineyards, cheese makers and olive oil groves. Marina Marchese will give a short talk about the city, places to eat, shop, visit Basic Italian language words of the day based upon honey and bees! and translate the daily itinerary of events each day.

For Travel Information contact
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MARCH - REGIONAL HONEY PRICE REPORT

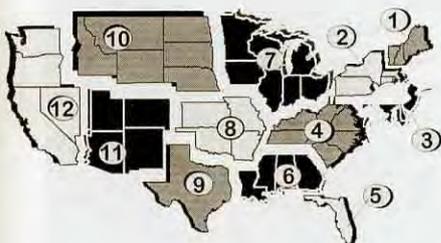
Again this year we polled our reporters on where they sell their honey. We've been doing this for several years, and the pattern is fairly predictable. Our reporters are primarily sideline or very small commercial beekeepers, with a few larger outfits represented that tend to be producer/packers.

If you are interested in expanding your honey (and other hive product) sales, look over this list of possible outlets. There are most likely some you are missing now and could investigate. Price is not the key to more sales so don't undersell your product. *Rather*, increase your exposure by increasing where your honey is sold.

By far the majority - more than 75% - of our reporters sell some of their honey from home, either an inside or outside stand. Interestingly, however, the amount of their honey they sell there is slowly declining...down to about a third of their crop this year. I suspect, but can't prove that this is price driven, because if you look at what venues have done since last year the trends become more clear. Farm markets have picked up sales considerably since last year...and with farm markets come price increases. Home sales have little investment in time...you're not standing all day talking, but farm markets have the advantage of one on one sales, encouraging repeat sales and meeting lots of new customers, plus a healthy price increase from those at-home sales. If you are just starting out, remember that if you are selling honey from home, your insurance may need tweaking since you are operating a business there. More businesses are requiring beekeepers to have some sort of liability insurance if they wish to sell honey at that outlet. Businesses don't want your problems to become their problems.

Work seems to be capturing more sales the past 3 or 4 years. Probably for the same reasons...a better price, and more people contact.

This year...open some new places to sell your honey. People want local honey. Give them a hand.



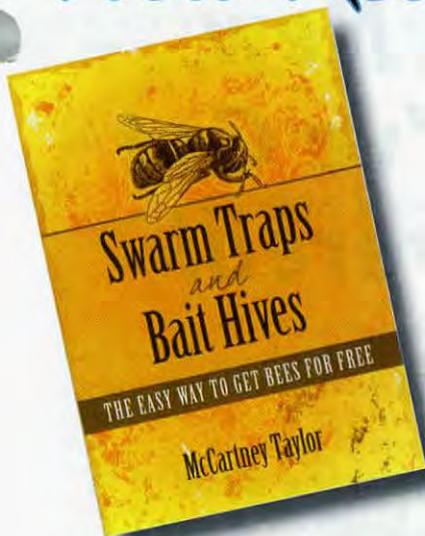
Where Do They Sell Their Honey?

% of Reporters Selling at these locations					% of Their Honey Sales at these locations					Locations Honey Sold at
2008	2009	2010	2011	2012	2008	2009	2010	2011	2012	
76	82	81	71	77	44	40	43	51	36	Home (inside or roadside stand)
16	20	13	17	16	37	34	14	26	19	Local community - sponsored farm market (i.e. Sat. & Sun. sales)
16	26	23	19	29	32	26	27	31	40	Local Farm Market business that's seasonal (Fall only, for instance)
18	26	32	26	29	39	36	38	34	33	Local Farm Market business that's year-round
10	8	9	8	4	30	29	34	24	33	Flea Market
34	39	37	35	39	20	26	19	18	24	Health Food/Organic store
13	11	8	12	10	5	11	37	9	8	Gift Store
14	20	19	13	16	25	16	22	20	21	Bakeries/Food Establishments
9	15	13	17	14	19	15	13	13	28	Local High-End Retail Outlets (gourmet stores)
24	37	37	30	31	19	16	19	22	16	Local, Small 'Mom & Pop' Retail Outlets (grocery & gas)
11	16	13	14	17	48	30	26	32	35	Local Small Packer or Producer/Packer
6	3	0	5	2	54	63	0	42	100	Huge Packer, they pick up
6	8	9	13	11	33	42	30	38	41	Wholesale only to larger stores, you deliver to warehouse
10	13	11	14	11	7	6	3	4	9	Breweries/Beer or Mead makers
6	10	4	6	10	29	8	8	6	10	Internet, direct retail, mail order
26	22	17	29	41	23	15	11	20	21	Work, direct retail
6	8	8	8	6	7	8	25	8	6	Local/State Fair, with club

*Total percentage of sales does not come out to 100% because of multiple outlets.

	REPORTING REGIONS												SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.69	1.95	1.70	1.63	1.80	1.74	1.69	1.68	1.68	1.70	1.67	1.75	1.63-1.95	1.72	1.74	1.67
55 Gal. Drum, Ambr	1.66	1.75	1.66	1.58	1.75	1.64	1.71	1.60	1.66	1.50	1.58	1.56	1.50-1.75	1.64	1.67	1.57
60# Light (retail)	145.00	171.00	149.00	140.00	160.00	167.50	142.50	157.67	150.00	139.50	165.00	173.33	139.50-173.33	155.04	157.30	137.65
60# Amber (retail)	145.00	161.00	149.00	139.25	160.00	161.67	138.33	110.00	144.33	144.33	148.00	174.65	110.00-174.65	147.96	152.13	138.75
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	63.36	72.82	58.00	61.73	74.68	60.00	58.75	74.68	74.68	59.92	80.00	87.87	58.00-87.87	68.87	70.41	59.30
1# 24/case	115.20	101.23	81.60	79.87	114.00	99.31	82.15	104.04	82.00	111.48	95.12	110.08	79.87-115.20	98.01	93.44	85.79
2# 12/case	114.30	83.68	75.90	75.00	111.00	81.76	76.43	75.00	73.00	86.16	70.53	89.80	70.53-114.30	84.38	83.25	73.18
12.oz. Plas. 24/cs	78.24	92.78	74.20	74.72	79.20	82.00	77.22	85.26	76.00	74.10	75.45	78.80	74.10-92.78	79.00	74.37	68.82
5# 6/case	110.00	101.32	89.25	79.57	96.00	133.00	83.17	103.43	72.00	88.98	67.39	100.00	67.39-133.00	93.68	94.28	84.13
Quarts 12/case	101.00	118.12	122.25	112.16	102.00	103.59	102.40	181.00	170.00	107.48	95.55	104.00	95.55-181.00	118.30	118.22	111.22
Pints 12/case	68.18	88.48	81.60	73.75	68.00	61.17	75.50	60.00	71.11	59.75	65.25	77.67	59.75-88.48	70.87	76.17	71.30
RETAIL SHELF PRICES																
1/2#	3.12	4.08	2.87	3.55	3.55	3.03	3.13	3.55	3.55	3.25	3.88	4.00	2.87-4.08	3.46	3.56	3.40
12 oz. Plastic	3.75	4.94	3.50	4.13	5.20	4.38	3.60	4.32	4.00	3.63	4.53	5.16	3.50-5.20	4.26	4.22	3.89
1# Glass/Plastic	5.50	5.89	5.25	5.38	6.00	5.95	5.05	5.86	5.00	5.95	5.44	6.75	5.00-6.75	5.67	5.53	5.30
2# Glass/Plastic	10.00	8.86	9.64	9.45	9.55	8.85	8.24	5.50	8.00	10.59	8.57	11.19	5.50-11.19	9.04	9.20	8.77
Pint	9.47	7.61	8.73	7.14	7.00	6.96	10.27	6.00	9.47	9.50	7.95	9.83	6.00-10.27	8.33	7.99	8.53
Quart	13.56	12.43	12.20	11.79	12.50	11.37	14.03	13.56	13.56	15.05	11.20	17.66	11.20-17.66	13.24	12.44	13.09
5# Glass/Plastic	23.75	19.24	21.96	19.70	24.00	25.00	19.21	22.42	18.00	21.89	19.89	25.00	18.00-25.00	21.67	21.33	19.22
1# Cream	7.58	7.61	6.75	6.23	7.58	6.75	6.61	7.58	7.58	6.77	6.99	9.50	6.23-9.50	7.29	6.48	5.99
1# Cut Comb	7.50	7.32	7.80	7.48	7.86	6.83	7.77	7.86	7.86	7.00	8.50	8.66	6.83-8.66	7.70	8.31	7.50
Ross Round	8.27	6.95	7.80	6.15	8.27	6.50	6.25	8.27	8.27	8.27	8.75	8.50	6.15-8.75	7.69	7.42	6.54
Wholesale Wax (Lt)	3.25	5.23	3.75	3.69	3.00	4.95	6.50	8.63	4.50	5.00	3.43	4.25	3.00-8.63	4.68	4.30	3.90
Wholesale Wax (Dk)	2.75	4.50	2.75	3.48	2.60	4.50	4.93	5.87	3.87	4.87	2.75	4.00	2.60-5.87	3.91	3.88	3.32
Pollination Fee/Col.	90.00	105.00	75.00	53.60	77.50	66.67	52.86	89.23	89.23	89.23	62.00	118.33	52.86-118.33	80.72	79.86	83.75

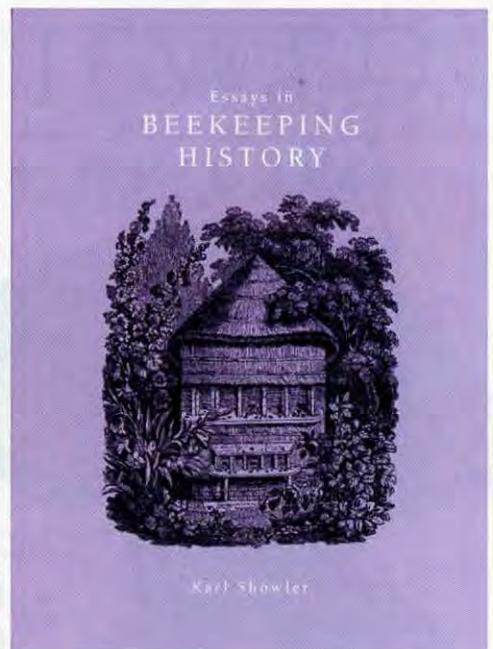
New Reading –



Swarm Traps and Bait Hives. The Easy Way To Get Bees For Free. By McCartney Taylor. Self Published. 50 7" x 10" pages, color throughout. Ebook format, delivered as a pdf file from LearningBeekeeping.com for \$9.75, Hard copy at Amazon for \$15 and change or CreateSpace for about \$14 with a discount code of H4X84PZS. ISBN 9781463739317.

Don't be put off by the size of this book. It's the handiest piece of work I've found in a long time. It's not

heavy in biology, but it has enough so you know why what's happening happens. But the real value is in the simplicity of making his swarm trap/bait hives. Truly, scrap lumber is all you need. No quirky exact dimensions, and a hole for a front door. A hole with a couple of nails in it so birds can't get in...you got birds, you don't have bees. You can use an 8-frame deep if you want. Baiting...yes, and what to use and why. Location is a high point...and I use that carefully, because he stresses that beekeepers shouldn't be on ladders. You can't run when you're on a ladder. Keep your traps not very high. And he talks a lot about location and timing. And if you make the trap right, you can take the swarm home in your car. Can you make a business out of this...yes, you can. Number your traps, make a map, or better...use a gps to mark the exact place you put the nail for next year. That piece of advice is worth the price of the book, let alone all the swarms you'll now catch. Last piece of advice...GUTS. Go Use This Stuff. I did. It works. – *Kim Flottum*



Essays In BEEKEEPING HISTORY. By Karl Showler. Published by Bee Craft Limited. 270 8.5 x 6.5 pages. Black and white, soft cover. \$27.45, plus postage from UK. Available at www.bee-craft.com/shop.

If beekeeping history is a bent of yours, then you and Karl have a similar passion, and you should probably have his newest book on your shelf. Karl's shelf, as you may know, holds probably the best collection of antiquarian beekeeping literature that exists.

As stated, this is a collection of essays, not entire life histories of each of the subjects, and there are many. He spotlights 22 different people, ranging from Frank Benton (of queen cage fame) to Charles Dadant, to LL Langstroth, to George Neighbor to Moses Quinby to Charles Butler to the Root family and more. Each essay is 10 – 15 pages, so it's an easy book to read in small chunks, and after reading essays about those I was familiar with, it's plain Karl has done his homework and has included the important details of each. He also includes a review of bee books written by women from 1670 – 1988, and then a review chapter on British Beekeeping history. All in all, it's a fun book to read, and definitely a major contribution to understanding why we do what we do today.

Kim Flottum

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RESEARCH REVIEWED

The Latest In Honey Bee Research

Steve Sheppard

“European researchers have shown a possible alternative use for a U.S. product.”

Beekeepers in Europe routinely treat honey bee colonies for *Varroa* mites while the bees are broodless and in their winter cluster, a practice that has not been widely employed in the U.S. One of the products used in this effort has been Perizin®, a liquid coumaphos treatment applied to the broodless Winter cluster. Oxalic acid dissolved in sugar syrup is also widely used as a Winter *Varroa* treatment for broodless clusters in both Europe and Canada. The advantage of a Winter treatment is that, with no mites “hiding” in brood cells, the entire mite population is exposed to the effects of treatment substances. Perizin® and oxalic acid are not registered for use as *Varroa* control substances in the United States. However, German researchers recently reported interesting mite control outcomes with an available American product, Hopguard® (Potassium salts of hop beta acids), when applied to broodless colonies in the winter (Rademacher and Harz, 2011).

Hopguard® is typically available on saturated cardboard strips that are hung between frames at a rate of one strip per five frames of bees. The strip can be applied up to three times per year to brood chambers and can be used during a honey flow if necessary. Rademacher and colleagues set up their experiment with 10 treatment and eight control colonies in December 2010. They used two strips per broodless cluster in the treatment colonies and left the strips in place for 17 days. Mite and bee mortality was determined periodically over an 11-day block within that period. At the end of the experiment, they did a follow-up treatment of all treatment and control colonies using oxalic acid (Oxuvlar®). The results indicated that after colony treatment with Hopguard®, mite mortality was >60% within 24 hours and more than

80% after 96 hours. Overall efficacy of the Hopguard® treatment after 17 days was 93.5%. In the control group 7.8% of the mites died over the same period, thus Hopguard® significantly reduced the mite population in treated colonies. Honey bee mortality over the same period was 7.2% in the treatment colonies and 0.7% in the control colonies, also a significant difference.

The authors concluded that their “preliminary results” showed potential . . . warranting further investigation and noted that in Germany and Europe, approval of the product for *Varroa* treatment seemed possible for 2012 and 2013, respectively.

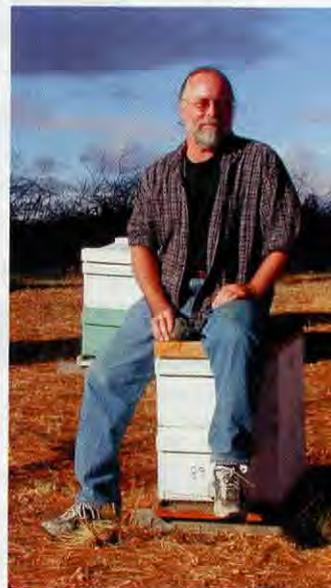
In the broadest sense, we can think of Hopguard® as a spin-off of the beer industry and certainly here in the Pacific Northwest where much of the U.S. hop cultivation occurs (and to take cue from the beer advertisements), it is “refreshing” to consider that this product may find a place in the list of alternatives to synthetic pesticides. As a caveat, if a colony goes into the Winter with a heavy load of mites, the “Winter” bees themselves are already compromised and the prospects for individual bee longevity and Winter survival of the colony are already diminished. Eliminating mites from the Winter cluster in such a colony is perhaps an outstanding example of a “fool’s errand.” On the other hand, treatment of a “healthy” Winter cluster (one with only a moderate or light mite load) with Hopguard® may diminish the mite population to the extent that mite treatments for the following Spring and Summer could be delayed or eliminated. In the great Almond pollination event, hundreds of thousands of colonies are transported to California annually in mid-Winter to get ready for their early early Spring task. Treatment of Winter clusters in

these hives prior to, during or just after transport (depending on temperatures) with Hopguard® could be workable within many management schemes.

It is an interesting turn that European researchers, using a product available in the U.S., have shown us a possible alternative use for a home grown product to control *Varroa* mites. As Rademacher and colleagues noted, we need additional research on this topic. One obvious area warranting further research is the colony effect (i.e. Winter survival) of the approximate 7% bee mortality that occurred over the experimental period in the Hopguard® treated colonies. Whether this is an acceptable “cost”, relative to the “benefit” of mite control, remains to be shown. As a final note, Hopguard® is available in many (but not all) states in the U.S. under a Section 18 emergency use permit. Check with your State Department of Agriculture to see if this product is legal to use in your location. **BC**

Dr. Steve Sheppard, Thurber Chair, Department of Entomology, WA State University, Pullman, WA 99164-6382, shepp@mailwsu.edu; www.apis.wsu.edu.

Rademacher, E. and M. Harz. *Application study: hop acids to control varroosis-colony trials.* 2011. *Apidologie.* 42:789.





A Closer LOOK



DRONE MATING

Clarence **Collison**
Audrey **Sheridan**

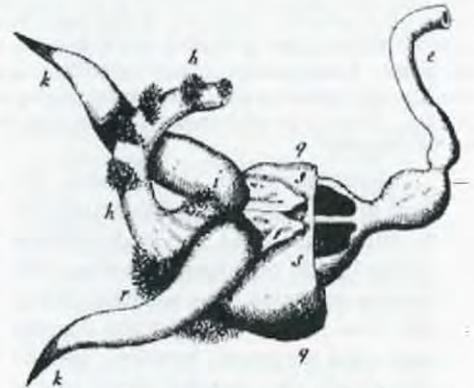
Mating occurs high in the air and on the flight.

After drones emerge from brood cells, they pass through an eight to 10 day period of sexual maturation before they start flying to the congregation areas that are visited by virgin queens. During this period, their flight muscles become fully developed and they also complete the maturation of sperm in their reproductive system (Colonello-Frattini and Hartfelder 2009). This maturation process appears to be controlled and synchronized by the endocrine system. Corpora allata activity and, consequently, the juvenile hormone titer gradually increase within the first days of adult life and exhibit a peak during this period of sexual maturation, promoting flight activity (Giray and Robinson 1996; Tozetto et al. 1997). Concurrently, the ecdysteroid titer drops and remains at basal levels during the rest of the drone's adult life (Colonello and Hartfelder 2003).

In drones the genital organs include a pair of testes, two vasa deferentia, which are partly enlarged as seminal vesicles, two accessory glands (= mucus glands), an ejaculatory duct and a complex internal penis or endophallus (Snodgrass 1956). The endophallus is composed of three main parts: the bulb, the cervix and the vestibulum. The bulb is provided with chitinous plates. The cervix has the fimbriate lobe at one side and the transversal folds at the other side. The vestibulum has a pair of large pouch-like yellow cornua that project laterally. Inside the abdomen, the chitinous plates of the bulb and the fimbriate lobe lay at the left side of the abdomen. However, during eversion, they turn to the dorsal side. Therefore, the side of the endophallus with the chitinous plates and the fimbriate lobe is called dorsal. The opposite with the transversal folds is called ventral side. The endophallus does not have any muscles (Woyke 2008).

The uneverted endophallus lies in the ventral part of the abdomen. From the basal part, the vestibulum, the pair of cornua and their orange-colored secretions project from both sides. In newly emerged drones the cornua have no pigmentation, about 1.7 days after emergence the first pigment can be measured spectrophotometrically. The amount of pigments increases with the main increase between the 2nd and 6th day of age (Koeniger et al. 1990).

Mating occurs high in the air and on the flight. During copulation, the drone everts his endophallus in the

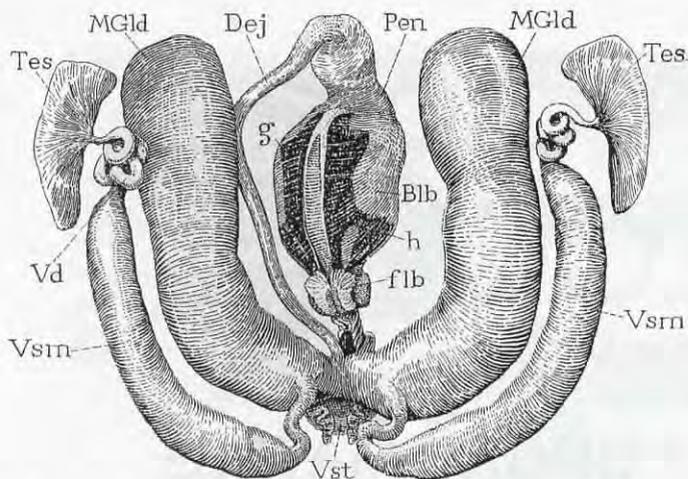


Swammerdam, 1738, partly everted endophallus, h~ slender tip at the end.

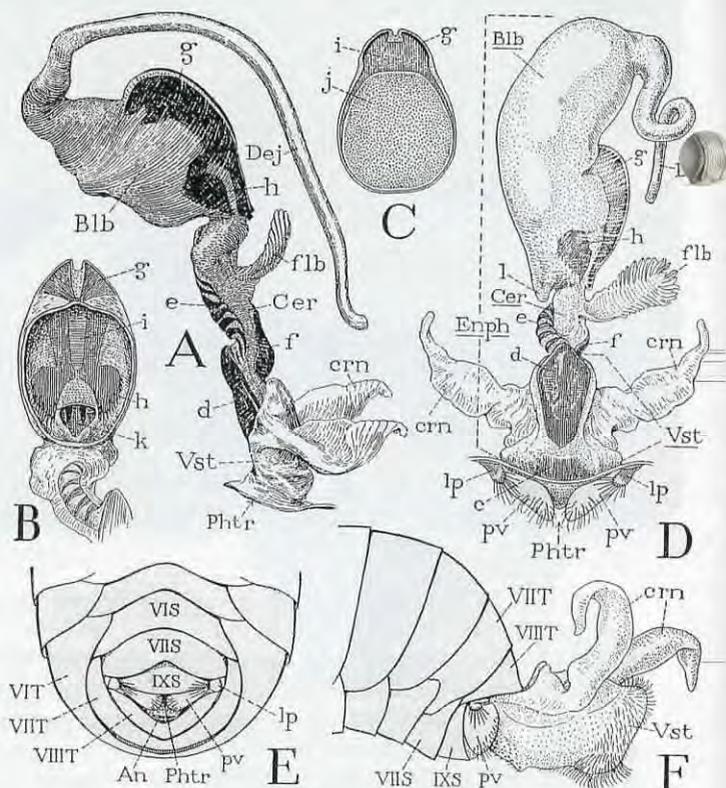
genital chamber of the queen (Woyke 1958a; Koeniger and Koeniger 1991). Eversion of the endophallus results from the pressure of the hemolymph which is pushed backwards by the contraction of the strong abdominal muscles (Woyke and Ruttner 1958). The cornua are the first to be everted. First their tips turn dorsally and outwards, afterwards the cornua tubes bend downwards (Woyke 1955) and their tips probably embrace the queen's abdomen (Woyke and Ruttner 1958).

While mating, the drone is paralyzed at the initial phase of this process, when the partly everted endophallus is introduced into a queen's sting chamber. The curved slender tip of the endophallus is inserted into the queen's vagina. It serves as a hook fixing the pair in copula. The cornua bend along the cranial wall of the sting chamber and their tips are directed toward the sting (Woyke 2011).





Above - Internal reproductive organs of the drone, somewhat spread out dorsal view. *g*, dorsal plate of penis bulb; *h*, lateral plate of penis bulb. **Right** - The intromittent organ and external lobes of the drone. **A**, the inverted penis, left side, bulb empty. **B**, interior of penis bulb, seen from below. **C**, cross section of bulb through dorsal plates (*g*) containing mass of seminal fluid and spermatozoa. **D**, penis and external genital lobes, dorsal, penis bulb distended. **E**, end of male abdomen, ventral. **F**, end of abdomen with penis partly everted. *c*, posterior dark area of ventral wall of vestibulum; *d*, ventral plate of vestibulum; *e*, row of ventral V-shaped sclerites of cervix; *f*, dorsal plate of cervix; *g*, dorsal plate of bulb; *h*, lateral plate of bulb; *i*, sclerotic inner wall of bulb beneath dorsal plates; *j*, coagulated content of bulb; *k*, aperture from bulb into cervix; *l*, pocket of bulb wall. Explanation of abbreviations - Blb, bulb of penis; Dej, ductus ejaculatorius; MGld, mucus gland; Pen, penis; Tes, testis. (Snodgrass)



Koeniger et al. (1996) were the first to attribute a glandular function to the cornua. As the endophallus turns inside out during mating, the cornua secretion covers the surface of the tube. The function of the cornua and their secretion, however, is controversial. The cornual gland of the drone's endophallus is an epithelial gland, whose cells extend from the tip of the cornual tube, along its lateral parts to the basic hump (dorsal cornua). The gland forms a stripe with a central region of dense and homogeneous secretory cells. To the sides the gland cells become sparse. The secretory cells contain mainly rough endoplasmic reticulum and numerous mitochondria. The nuclei have several nucleoli and are situated at the apical part. Microvilli border the microfibrillar cuticula into which cell projections often intrude. At the basal membrane the cells are often

subtended by a layer of fatty tissue, and oenocytes can also be attached. The secretion in a three-day-old drone appears either as an orange-colored layer or as osmiophilic granula mainly near the lumen of the corneal tube (Koeniger et al. 1996). The cuticula of the corneal tube is untanned and non-sclerotized. Along the lumen of the cornua it is extremely folded and papillated, forming in situ small cavities which contain osmiophilic drops of the secretion often accumulated in groups. No pores were found, although small granules of secretion occur within the cuticular layers, with the highest concentration near the lumen. During eversion of the cornua the secretion merges on the surface of the cuticula.

Moors and Billen (2009) studied the morphology and ultrastructure of the cornua glands of *A. m. carnica* Pollmann drones of different ages. Cornua glands were studied in pupal drones (11, 12, 13 and 14 days after brood cell closure) and in drones captured 0, three, six, nine and 12 days after emergence. Two epithelial types could be distinguished, each corresponding with a different type of cuticle; one covered with a smooth cuticle and the other with a cuticle provided with indentations. Both types are visible in the pupal stages as well as in adult drones. The thickness of both epithelia decreases during the period of sexual maturation. Ultrastructural research did not reveal a difference between the two epithelia.

Koeniger (1986) and Koeniger et al. (1990) showed that the cornua secretion becomes part of the mating sign, left by the drone after copulation. The mating sign consists of mucus from the mucus glands, expelled chitin plates from the bulb and a sticky orange layer synthesized by cornua gland



Drone endophallus, ventral view.



Endophallus, ventral view.



Partly everted endophallus.

Photos by J. Woyke

cells (Koeniger et al. 1996). As the mating sign can be removed by the next drone and the drones preferably grasp and mate with queens having a mating sign, the outside layer of the cornua glands may serve as an optical cue (Van Praagh et al. 1980; Vallet and Coles 1993). Furthermore, the sticky orange corneal secretion may reinforce the attachment between drones and queens and may keep the mating sign in place (Koeniger et al. 1996; Koeniger and Koeniger 2000).

During natural mating, the slender duct at end of a partly everted endophallus penetrates into the vaginal orifice of the queen. The increased pressure inside the endophallus, injects the semen with great force. The semen must pass the small vaginal orifice of the queen and then must be forced into the lateral oviducts. Many times the oviducts already contain semen from previous matings. Thus, the ejaculation of semen under great force is especially important during multiple matings (Woyke 2008).

Queens returning from successful mating flights have the semen in lateral oviducts and the mating sign in the sting chamber. The mating sign consists of chitinized plates of drone endophallus filled with mucus. The orange membranes covering both sides of the mating sign do not touch the hairy rim of the bursa copulatrix. The thin thread at the end of the mating sign is pushed forward on the surface of the sign in most queens. This makes the end of the sign look blunt. Simulated stages of natural mating showed that it is impossible for the orange membranes covering the cornua of the endophallus to become stuck to the mating sign of the same drone. Mating signs with additional pairs of orange membranes were found. In some queens, the semen or additional second mating signs were found at the end of the sign protruding from queen's sting

“Thus three substances, semen, mucus and epithelial membrances are ejected during endophallus eversion and natural mating with queen bees.”

chambers. Those three additional parts originated from drones, which attempted to mate, but failed to remove the mating sign of the predecessor. The thin thread at the end of the mating sign was pushed to the surface of the sign, because the next drone attempted to mate, but failed to remove the sign of its predecessor. The last drone, which failed to mate, left the orange membranes of his endophallic cornua at the mating sign of his predecessor. Thus, the mating sign originates from two drones. The chitinized plates and the mucus originate from one drone, but the orange membranes originate from the last drone(s), which attempted to mate, but failed to remove the sign of his predecessor (Woyke 2011). It is suggested that the queen terminates the mating flight, because the last drone attempting to mate failed to remove the mating sign of the predecessor.

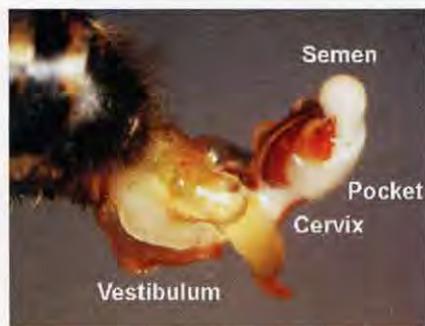
During eversion of the endophallus, the mating sign is created without damaging the endophallus (Woyke 1958b, and Woyke and Ruttner 1958). Woyke (2008) suggests that during natural mating, the complete eversion of the endophallus separates the drone from the queen, after the mating sign is pushed into the sting chamber of the queen.

Mating signs are located between the queen's elevated sting and the ventral terminal sclerite. The average size of the mating sign (height, width, length) without the thin thread at the end was 1.75 mm, 1.60 mm and 3.2 mm, respectively. The chitinized plates of the mating sign were situated, in most queens, at the ventral side of the sting chamber almost

parallel to the terminal sclerite. The anterior part of the sign was filled with mucus. The posterior part of the sign, protruding from the end of the abdomen, consisted of epithelial membranes originating from the mucus glands (Woyke 2010).

In a two-choice test, drones preferred queen models marked by a distinctly colored 'mating sign' (secretions of the drone's copulatory organs) to unmarked models. This was true also for models marked by aluminum foil. Dark-colored drones preferred to copulate with light-colored models and vice versa. Models carrying copulating drones were more attractive than single models. Thus a copulating drone as well as the mating sign and other colored markers increased the attractiveness of a queen. The mating sign may indicate a form of cooperation between drones by marking a queen after sperm transfer to facilitate the identification of a queen by the following drones (Koeniger 1990).

Woyke (2010) examined the substances ejected during eversion of drone endophalli, as well as substances present in the mating sign. In the fully everted endophallus, creamy semen was found near the chitinized plates, amorphous white mucus was located further distally and a transparent-whitish condensed substance appeared at the end of the everted endophallus. In mating signs, white mucus was found near the bursa copulatrix of the queens and a transparent-whitish condensed substance in the distal part of the sign. Microscopic examinations showed that the transparent-whitish



Semen at the end of everted endophallus.



The bulb in the pocket of everted endophallus.



Fully everted endophallus, semen near chitinous plates.

substance consisted of fragments of epithelial membranes sloughed from mucus glands. Thus three substances, semen, mucus and epithelial membranes are ejected during endophallus eversion and natural mating with queen bees.

The reproductive tract of a drone contains a pair of very large accessory glands (Snodgrass 1956), also called mucus glands. These glands are located in the postventral region of the abdomen and undergo substantial change with respect to age. They attain full maturity during the first nine days after emergence and their secretion changes from a fluid to a viscous, slightly alkaline mucus (Moors et al. 2005). During copulation, the drone everts an endophallus (Woyke 2008) and transfers sperm together with the highly viscous mucus secretion. This secretion rapidly polymerizes when exposed to air. Considering that drones lack external genitalia and claspers, it may play an important role as a glue to maintain the drone attached to the queen until sperm transfer is completed. Subsequently, the endophallus ruptures and the mucus gland secretions form a mating plug that also contain corneal gland and bulbous secretions (Koeniger and Koeniger 2000). Contrary to what one might expect, this mating sign is not a functional plug that prevents a queen from quickly remating with other drones in the congregation area. Rather the following drone uses a special hair field on the genitalia to remove the mating sign (Koeniger and Koeniger 2000). Apart from speculations on serving as a glue during in-flight copulation, little is known about the products or functions the accessory gland secretions in bees.

Colonello and Hartfelder (2003) surveyed the proteins secreted into the lumen of the mucus glands. These glands secrete an enormous amount of protein during sexual maturation of the drones. The molecular mass of mucus proteins ranges from 25 to 174 kDa, but it is a set of only three proteins between 43 and 47.5 kDa that gradually becomes dominant in the protein spectrum. When comparing the mucus gland secretion of newly emerged drones to eight-day-old sexually mature drones, they observed a striking reduction in protein pattern complexity as the drones age. This increase in the amount of total

protein, accompanied by a reduction in protein pattern complexity, was found to be contingent on the decreasing ecdysteroid titer. Injections of 20-hydroxyecdysone caused a delay in mucus gland maturation, impeding the protein content increase and conserving the complex protein pattern typical of newly emerged drones. **BC**

References

- Colonello, N.A. and K. Hartfelder 2003. *Protein content and pattern during mucus gland maturation and its ecdysteroid control in honey bee drones*. *Apidologie* 34: 257-267.
- Colonello-Frattini, N.A. and K. Hartfelder 2009. *Differential gene expression profiling in mucus glands of honey bee (Apis mellifera) drones during sexual maturation*. *Apidologie* 40: 481-495.
- Giray, T. and G.E. Robinson 1996. *Common endocrine and genetic mechanisms of behavioral development in male and worker honey bees and the evolution of division of labor*. *Proc. Natl. Acad. Sci. USA* 93: 11718-11722.
- Koeniger, G. 1986. *Mating sign and multiple mating*. *Bee World* 67: 141-150.
- Koeniger, G. 1990. *The role of the mating sign in honey bees, Apis mellifera L.: does it hinder or promote multiple mating?* *Anim. Behav.* 39: 444-449.
- Koeniger, G., M. Wissel and W. Herth 1990. *Cornual secretion on the endophallus of the honeybee drone (Apis mellifera L.)*. *Apidologie* 21: 185-191.
- Koeniger, G., H. Hänel, M. Wissel and W. Herth 1996. *Cornual gland of the honeybee drone (Apis mellifera L.): structure and secretion*. *Apidologie* 27: 145-156.
- Koeniger, N. and G. Koeniger 1991. *Evolutionary approach to mating behavior and drone copulatory organs in Apis*. *Apidologie* 22: 581-590.
- Koeniger, N. and G. Koeniger 2000. *Reproductive isolation among species of the genus Apis*. *Apidologie* 31: 313-339.
- Moors, L. and J. Billen 2009. *Age-dependent morphology and ultrastructure of the cornua glands in drones of Apis mellifera*. *Apidologie* 40: 600-607.
- Moors, L., O. Spaas and G. Koeniger 2005. *Morphological and ultrastructural changes in the mucus glands of Apis mellifera drones during pupal development and sexual maturation*. *Apidologie* 36: 245-254.
- Snodgrass, R.E. 1956. *Anatomy Of The Honey Bee*, Comstock Publ. Assoc., Ithaca, NY, 2nd ed.
- Tozetto, S.O., A. Rachinsky and W. Engels 1997. *Juvenile hormone promotes flight activity in drones (Apis mellifera carnica)*. *Apidologie* 28: 77-84.
- Vallet, A.M. and J.A. Coles 1993. *The perception of small objects by the drone honeybee*. *J. Comp. Physiol. A*. 172: 183-188.
- Van Praagh, J.P., W. Ribi, C. Wehrhahn and D. Wittmann 1980. *Drones fixate the queen with the dorsal frontal part of their compound eyes*. *J. Comp. Physiol.* 136: 263-266.
- Woyke, J. 1955. *Multiple mating of the honeybee queen (Apis mellifera L.) in one nuptial flight*. *Bull. Acad. Pol. Sci.* 3(5): 175-180.
- Woyke, J. 1958a. *The histological structure of the reproductive organs of the drone*. *Poznan Soc. Friends Sci., Publ. Sect. Aric. Sylvic.* 19: 38-50.
- Woyke, J. 1958b. *The process of mating in the honey bee*. *Pszcz. Zesz. Nauk.* 2: 1-42.
- Woyke, J. 2008. *Why the eversion of the endophallus of honey bee drone stops at the partly everted stage and significance of this*. *Apidologie* 39: 627-636.
- Woyke, J. 2010. *Three substances ejected by Apis mellifera drones from everted endophallus and during natural matings with queen bees*. *Apidologie* 41: 613-621.
- Woyke, J. 2011. *The mating sign of queen bees originates from two drones and the process of multiple mating in honey bees*. *J. Apic. Res.* 50: 272-283.
- Woyke, J. and F. Ruttner 1958. *An anatomical study of the mating process in the honeybee*. *Bee World* 39: 3-18.

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ITALIANS

A Short History Of Introduction To England & Then The U.S.

John Phipps

Foreign V. Native Bees - an Ethical or Practical Issue in the UK?

The first bees I ever kept were a strain of pure Italians from E.H. Taylor of Welwyn Garden City, a long standing supplier of beekeeping equipment and bees in the UK. The bees arrived as a six frame nucleus just a few weeks after I had completed a three-day beekeeping course there conducted by two of the firm's employees. As part of the course we were introduced to the bees in Taylor's apiaries and, although initially rather nervous, myself and the other people participating became less anxious when we saw how calm the bees were with no one at all getting stung.

Undeniably, the bees I bought were gentle and easy to handle; they drew out the combs quickly and by August gave me almost a full super of honey - thus recovering the money I has spent on the small colony. For a beginner they were ideal. I didn't receive one sting in the first few months and finding the golden tan-colored queen was never difficult.

However, problems did emerge in the following year when a second generation of bees were raised by making splits. These bees were totally unrecognizable from the bees of the previous year both in color (not a problem) and behavior (a real problem which had to be contended with). They were aggressive, ankle-stinging followers, bees which stung me so badly on one inspection that I had to seek medical aid due to an adverse reaction to their stings; so much so that I thought that this might have been the end of my beekeeping days. Admittedly, I had opened the colony when a thunderstorm was brewing when I knew that the bees' temper was likely to be worse than usual, but, as a beginner, I was fearful of going beyond the ninth day of the cycle of inspection in case I might lose a swarm.

Fortunately, I have suffered no adverse reaction to bee stings since that one occasion 40 years ago despite having had thousands of stings, but it did make me aware of the fact that imported queens were okay, as long as you intended to keep buying in pure bred queens from the importer. Okay for oneself I should have said, for the crossing of local newly-emerged queens mated with my Italian drones would undoubtedly have caused problems for other beekeepers in my area.

It was really only when I met the Ministry of Agriculture's Regional Entomologist, Beowulf Cooper, that I began to realize more fully the impact that foreign races had on local strains of bees. Apart from his work for the Ministry, Beowulf Cooper was the founder of an organization, then called the British Isles Bee Breeders Association (BIBBA), the aim of which was to find and conserve the native honey bee of the British Isles. Over the years many imports of bees had been made into the United Kingdom, some initially because they were a novelty; then with the help of the Ministry to re-establish beekeeping



Langstroth: "The Italians gather more than twice as much honey in the same localities, in the same time, as the swarms of native bees."



The tan-colored queen was always easy to find. ⇨



Dzierzon, having tried various races of bees declared that the original black bee was so bad tempered police were called when neighbors had become attacked by them whereas the Italian bees were easy to handle.

throughout England because of the enormous losses due to the Isle of Wight Disease at the beginning of the 20th Century (usually attributed to acarine disease); then latterly by individual beekeepers buying imported queens and bees from beekeeping suppliers to replace the mishmash of bees they had in their apiaries: mongrels resulting from the varied mass importation of races earlier in the century.

In the 1970s the import of bees was almost unrestricted - there was no *Varroa* to worry about and viruses were hardly heard of, the only real problem was that of the two foul broods. A good selection of foreign races and strains could be obtained as well as the home bred Buckfast queens selected and produced by Brother Adam of Buckfast Abbey, who had access to isolated mating stations in the remoter parts of Dartmoor.

Beekeepers who didn't quite take to foreign races often found that their stocks could only be handled with difficulty and it is not surprising that they became under the influence of Beowulf Cooper's association. BIB-BA's immediate attention was not to provide suitable queens for its members but to get them to look closely at their own bees to see if native bee characters could be observed, visually, behaviorally and eventually by the use of morphometry. It was then up to the beekeepers to work with their local groups to breed from those colonies which had good potential so native, or near native queen bees

could be used to head new colonies.

Not surprisingly, the question of importing queens became an ethical issue, so much so that it was frowned upon for some beekeeping journals to carry adverts for foreign races. I remember Cecil Tonsley, the long serving editor of *The British Bee Journal* giving a lecture on the good qualities of Italian bees which was immediately followed by Beowulf taking over the platform to talk about the native Black, and explaining why they were most suitable for the British Isles. Neither of the speakers referred to each other; they could have been from separate planets, but as often is the case, the audience must have been totally perplexed as to whom they should believe. This is frequently the case when two experts with conflicting opinions deliver their lectures in the same afternoon. I remember Beowulf Cooper saying afterwards in his usual matter-of-fact way that the BBJ was built on, and continued to function by, advertising revenue from the sellers of imported queens.

The First Imports of Italian Queens.

However, this is not an article which is meant to be disparaging towards Italian bees; after all, I have kept pure strains and enjoyed them. Indeed, the Italian bee is the most prominent bee in commercial apiaries around the world. So my question is, fundamentally, why has it become so popular?

According to one writer, though I forget his name, the importation of Italian bees into England, to him, was second only to Langstroth's utilization of the bee space in his hives, as regards milestones in the history of beekeeping.

Italian bees, though mentioned by both early Greek and Roman writers, were not brought to the attention of beekeepers in the western world until 1848 when Captain Balderstein wrote about them in the beekeeping journal *Bienenzeitung*. He became aware of them as a separate race when he was stationed near Lake Como on the border of Italy and Switzerland during the Napoleonic War. He saw that in coloring and in behavior (they were more industrious), that they were different to 'the common kind'. Whilst honey bees in the north were darker, the bees he

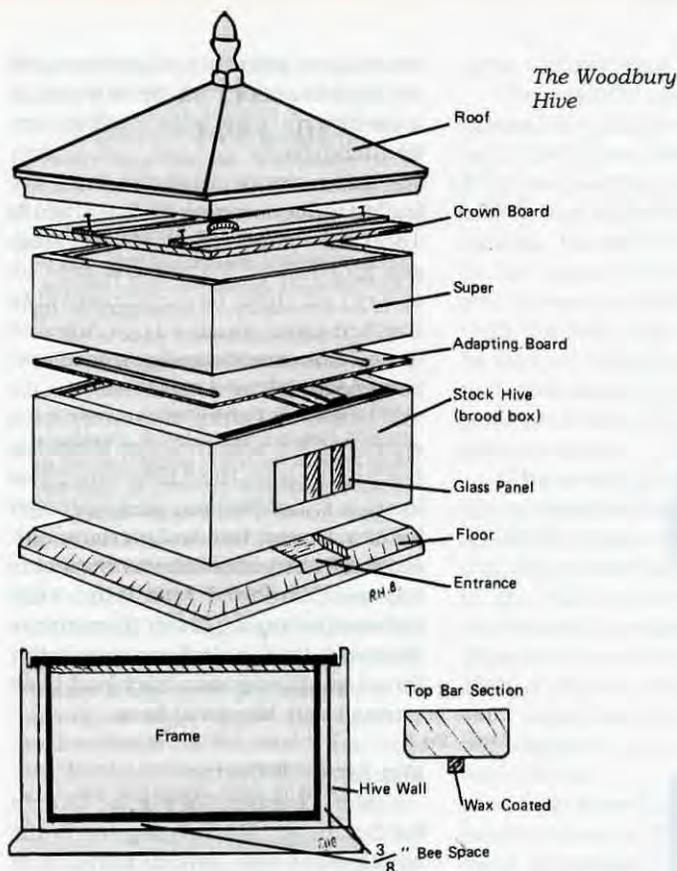


Thomas Woodbury was responsible for the first import and successful introduction of an Italian queen into a British colony.

became aware of had distinctive yellow bands. When he retired from the army in 1843 he procured a stock of the bees and had them carried over the mountain to his home in Switzerland where they performed well. Balderstein's writings became known to Dzierzon who obtained such bees and used them for his studies in parthenogenesis.

Imports Into England

The first Italian (sometimes called Ligurian) bees reached England in 1859 and were imported by Thomas Woodbury of Exeter together with Alfred Neighbor of London both of whom sold hives and bees. Woodbury's first Italian queen was bought from Mr Hermann, from the Tessin region of Switzerland, the plains of which slope into Italy. She arrived by train on the 3rd of August accompanied by a thousand or so bees housed in a rough wooden box. Woodbury gently shook the bees into an already prepared eight-bar hive which had four frames containing honey and pollen plus one empty comb. This small stock was then boosted with local black bees from a skep weighing 34.5 lbs. In order to unite the bees, the ones in the skep were emptied on to four pieces of cloth which had been placed on the ground and with the help of his friend Mr. Fox, they found and removed the local queen. The hive containing the Italian bees was placed over the shaken bees and much to their consternation the bees fought each other with many bees found dead outside the hive the fol-



lowing morning. The bees were left alone and Woodbury's patience was rewarded when on August 17th he noticed that enormous loads of pollen were being carried into the hive - a sure sign that all was well within.

As a writer for the 'Cottage Gardener' Woodbury was able to describe his achievement of successfully introducing the first foreign queen into a colony of British bees and within days he was receiving letters from all over the country with requests for stocks raised from this colony for the following season. He quickly cabled Hermann for two more queens which took four days to arrive and whilst most of the accompanying bees were dead, the queens had survived and were successfully introduced. Two further queens arrived at his apiary in September, though still wanting more he was told that it was now too late in the season for further shipments.

Unfortunately, the following year was disastrous as regards the weather and plagued by ill-health Woodbury was only able to raise one queen for sale. The following winter was severe, yet the Italian bees proved to be hardy - even the one which he had raised and had been dispatched to Scotland where the temperature fell to -1°F on the 24th December 1860.

As a writer Woodbury was able to

extol the virtues of the Italian queens and there was a great demand for them. He was joined by Mr. T.W. Cowan the Editor of the *British Bee Journal* and Chairman of the British Beekeepers Association in his assessment of their fine qualities who stated in 1893: 'Much prejudice existed against Ligurian bees at first, but their superiority over the common black bees is now almost universally admitted. This introduction has done much to improve our race of black bees by introducing new blood.'

Woodbury together with Neighbor were responsible for the shipping of four stocks of Italian bees to Melbourne, Australia on board the steamship *Alhambra* in 1862. Woodbury himself packed the bees which left England on the 25th September and arrived safely in Australia on the 12th of December, a newspaper article claiming later that 'They have since multiplied - the climate and pasturage of Australia greatly favoring the increase of this superior variety of bee.'

Samuel Simmins

One of the biggest proponents of Italian bees (or Ligurians as he called them) was Samuel Simmins in the latter part of the 19th century. His book, 'A Modern Bee Farm' was

printed by the thousands and is still worthy of a close read even today. Within his book he lists the qualities of most of the bee races and whilst he favored, bred, and sold hundreds of Italian queens, he is fair in his assessment of them, though it's true that many of his followers particularly liked their golden colors (F.W. Sladen used their color as a very important selling point for his Italian Queens). At the time of his writing the 1904 revised edition of his book he says that 'there is perhaps hardly a district where the native bees have not to some extent . . . received some benefit of the infusion of fresh blood.' He goes on to say that whilst old fashioned beekeepers considered the Italians to be inferior to native bees, the influence of the Italian was so strong that after each cross the Italian coloring gradually disappeared and the 'blacks' which many beekeepers declared to be better were in fact Italians in disguise - something he found quite amusing.

The British Bee Journal

Not surprisingly, the case for or against Italian bees featured prominently in the pages of the *British Bee Journal* which was founded in 1873, 14 years after the first introduction of Italian bees into England. By this time beekeepers were quite familiar with these imports and the most notable writers of the time tended to give them almost unreserved support, though several, of course, had a vested interest in their sales.

Whilst I have no back copies of the journal to sift through, fortunately written *The Victorian Beekeeping Revolution*² with much of the material gleaned from the BBJ since its inception. Regarding Ligurian (Italian) bees, in the first Vol of the BBJ in March, we learn that breeding bees was thwarted with difficulties: Lawes writes, quoting from the BBJ, 'The immediate challenge was to keep control of the progeny of Ligurians "the superior qualities of which are acknowledged by all beekeepers" and to prevent the "highborn and beautiful queen" from "marrying beneath her"'. The beekeeper who finds that she has produced undesirable hybrids "in disgust at his disappointment, simply pinches her head off". As Lawes says, "Ligurianising" was proving a vexatious process which

The Victorian Beekeeping Revolution



A page featuring early issues of the BBJ from "The Victorian Beekeeping Revolution."



often ended in tears. Later on this is reiterated when Lawes relates that the BBJ had many enquiries from beekeepers 'who needed to know the manipulations needed to follow the fashion for replacing black bees with Ligurians'. Lawes also gleans that Ligurian queens which were selling for 30 shillings in 1964 were available in 1874 from the BBJ office for only seven shillings and sixpence; by then they were obviously so numerous and easily available that beekeepers were able to obtain them at the much lower price. By the 1890s we hear that whilst Ligurian bees continued to be popular, other beekeepers began to look for more exotic bees, especially those from Cyprus.

(A) Advantages (B) Disadvantages of Italian Bees (in contrast to British Blacks):

(A) More prolific; earlier Spring build up; work at lower temperatures; gather more honey; can reach deeper nectaries; continue to forage well into Autumn; draw out foundation well even late in the season; and more gentle.

(B) Stored honey in comb not so good; not such good comb builders (despite reference to foundation drawing above!); reluctant to enter supers; produce only a few queen cells so no good for queen rearing.

Summary - good all round bee; hybrids will be energetic workers but with very bad tempers.

Imports into the USA

Henry Alley

In his book *The Beekeeper's Handbook, or Twenty-Two Years Experience in Queen Rearing*¹, Alley quotes Dzierzon as being the person who should be credited for popularizing the Italian bee. Aided by the Austrian agricultural society of Vienna, Dzierzon imported the first Italian bees into Austria; 'and after thoroughly testing them, pronounced them superior in every respect to the native, as they swarmed earlier, were more industrious and hence better honey gatherers, more gentle and yet more courageous and active in self defense and far more beautiful.' So, once again we get a strong hint that beekeepers were attracted by the

cosmetic appearance of the race and on the down side, but cleverly put as a positive trait, the bees could be very bad tempered.

Alley claims that the first live Italian queens reached the USA in 1859 were imported by Messrs Wagner, Colvin and Mahan and goes on to say that these importations led to the 'bee fever' which struck America 'both as a science and a remunerative vocation'.

However, after a quarter of a century Alley acknowledged that the Italian bees in the USA, due most likely to hybridization, were no longer a distinct race, but an American Italian strain 'superior in every respect to any ever imported from Italy'. Alley is therefore saying much the same as Simmins, that the Italians were better for all purposes once they had been crossed with the local bees.

Mrs Lizzie E Cotton

Mrs. Lizzie Cotton is known for her book 'Beekeeping for Profit' which went into several editions in the last couple of decades of the 19th Century. She had a vested interest in promoting Italian bees as she sold them for a living together with her own type of hive. In the third edition of her book (1891) she wrote:

Some of my friends claim that the honey collected by the Italian is of better flavor, and a nicer quality generally, than that collected by the common bees; and this may be the case in some localities where there are certain varieties of flowers accessible to the Italians, but not accessible to the natives, the latter being smaller. Yet in my location I see no difference in the quality of the honey collected by the two varieties, but a great difference in favor of the Italians, in the quantity collected.

I will furnish six full swarms of Italian Bees, each in Controllable Hive; the brood section (six moveable comb frames) filled with comb, honey, eggs and hatching brood well supplied with bees; a healthy prolific queen; everything ready for work; full swarms, strong and healthy; first class in every respect, with full set of boxes (the two sizes) in place on the hive each box containing comb ready for the bees to fill with honey feeder on each ready for feeding. I will furnish the six swarms as described, for One Hundred Dollars. I will furnish one swarm of Italian Bees in Controllable

Hive with boxes, feeder and all fixtures required for Twenty Dollars.

Spring is the best time to commence Bee Keeping on my plan. No one need be prevented from obtaining these bees no matter how great the distance they reside from me.

I guarantee safe delivery at any express office.

Tammy Horn has much to say about Mrs. Cotton in her new book 'Beeconomy' much of which is not favorable to her. Whilst her bees may well have been ok it seems that Mrs. Cotton's ideas and advice on beekeeping were rather suspect. She said that all drone brood be cut out from the combs, that bees should be fed continually throughout the year and that using her hive and methods the bees would never swarm. Not surprisingly her name cropped up regularly in *Bee Culture's* column 'Humbugs and Swindlers (maybe the column should be revived?) as beekeepers became frustrated and angry when their bees swarmed and never showed any profit. It seems that a scam of hers was to advertise hives and bees at a bargain price but at the same time ensuring that the advert wasn't likely to appear until the offer had lapsed. The general opinion is that she preyed upon beginners who knew no better or as a letter writer to the *ABJ* put it 'greenhorns who are too penurious to take a reliable bee periodical'.

Italian Bees: Original Source Material

1. The New England Farmer, Volume 12. September 1860

During the early part of last year the Commissioner of Patents at Washington authorized Mr. S.B. Parsons, of Long Island, NY, to proceed to Italy, and inquire into the habits of Italian bees, and if, upon investigation, he found them possessing qualities of value which American native bees did not possess, to procure a certain number of swarms and send

them to the Patent Office.

He entered upon the duties assigned him, and arrived in the country of the Italian Lakes in April, 1859. After wandering about among the hills of that delightful region for some months, his researches were arrested by the approach of hostile armies, and he was not able to resume them until the following September, when he met an intelligent Bavarian who had established himself in the Grisons, and had devoted himself to the culture of pure Italian bees.

The result of his researches convinced him that these bees possessed qualities superior to those of our own, and he ordered for the Department to the full amount which he was authorized to expend, and directed them to be sent by the Arago on the 18th of October from Havre, but by some unaccountable delay they were not shipped until December 28th, from Genoa.

In his investigations, Mr. Parsons says he came to the following conclusions in relation to the Italian bees:

1. That they will endure the cold better than ours.
2. That they swarm twice as often.
3. That they are abundantly more prolific.
4. That the working bees begin to forage earlier, and are more industrious.
5. That they are less apt to sting, and may be easily tamed by kind treatment.
6. That the queen may be so educated as to lay her eggs in any hive in which she is placed, while the bees of such a hive, deprived of their own queen, will readily receive her.
7. That its proboscis is longer, and it can reach the depths of flowers which are entirely beyond the efforts of the common bee.
8. That a young queen, once impregnated, will continue fertile during her life - from four to seven years. This quality will insure pure broods, till the whole country is



Mrs. Lizzie E. Cotton

filled with them.
9. That they are far more brave and active than the common bee; will fight with great fierceness, and are more effectually at keeping the moth out of the hive.

Having read the statement of Mr. Parsons, and learning that Mr. Brackett, of Winchester, in this State, a gentleman who has gained some celebrity as a 'skillful cultivator of several varieties of grapes', had introduced the Italian bee into his colonies, we visited (The New England Farmer) his place a few days since, and examined both bees and grapes for ourselves. In the midst of his delightful retreat, surrounded on all sides but the south by the natural forest, he nestles on the hillside with his pleasant family, his forcing houses, grapes, and other plants, and his twenty odd swarms of bees! He is full of zeal in regard to them all - and that zeal is so admirably tempered with knowledge, that one cannot fail to gather valuable suggestions upon any of his favorite topics. Mr. Brackett was early called into consultation with Mr. Parsons, and one or two other distinguished apiarians, in regard to the course to be pursued with the Italian bees, and as a part of the policy he has introduced eight pure

1884. FOURTEENTH YEAR. 1884.

W. P. HENDERSON,
Murfreesboro, Tennessee.

Rearer of Italian and Syrian Queen Bees,

ITALIAN QUEENS,
At 75 cents each, by mail,

Choice Select Tested Queens, \$3.00. Ordinary, good Tested Queen, \$2.00 and \$2.50. Untested Queens, \$1.00, \$1.25 and \$1.50, according to season and quality. Queens sent by mail, and safe arrival guaranteed. Also, full and nucleus colonies at all seasons.

AFTER JUNE 1st.

Early ads for queens.

queens into his colonies, having first by a most ingenious device driven all the drones, or males, of the common bee from his hives. The queen of the common bee and the drone brood being taken away, and a new Italian queen introduced, the natural work was at once entered upon of forming new queen and brood cells, so that the eggs deposited by the new queen would produce the pure Italian bee!

From the experience thus far gained, Mr. Brackett is inclined to confirm the statements made by Mr. Parsons. He thinks their merits have not been overrated, and states that they are more easily managed, and less sensitive to cold than our bees.

From a little work by H.C. Hermann, the Bavarian referred to above, we learn that the yellow, Italian bee is a mountain insect; it is found between two mountain chains, to the right and left of Lombardy and the Rhetian Alps, and comprises the whole territory of Tessin, Veltlin and South Graubünden. It thrives up to the height of 4500 feet above the level of the sea, and appears to prefer the northern clime to the warmer, for in the south of Italy it is not found.

It differs from our common black bee in its longer, slender form, and light chrome-yellow color, with brimstone-colored wings, and two orange-girdled girths, each one-sixth of an inch wide. Working bees as well as drones have this mark. The drones are further distinguished by the girths being scolloped, like the spotted water-serpent, and attain an astonishing size; almost half as corpulent again as the black drones. The queen has the same marks as the working bees, but much more conspicuous, and lighter; she is much larger than the black queen, and easy to be singled out of the swarm on account of her remarkable bodily size and light color.

We engaged with Mr. Brackett in some manipulations, such as taking out the queen bee and a drone or two for examination, and peeping into some of the nuclei which he is forming.

2. American Agriculturist, Volume 19. August 1860

Inaugurating a Queen Bee

The incidents attending the inauguration of a Queen among bees, are less ceremonious, perhaps, than a similar transaction among men, yet to the observing naturalist they are

full of interest. An account of one of these events, happening the present season, was described in a private letter, recently received by Samuel B. Parsons, and it interested us so much, that we solicited the privilege of making the extract below. Mr. J.H. Pierce of Montgomery County, Ohio, received an Italian Queen bee from Mr. Parsons, and Mr. Langstroth happening to be in the neighborhood, was requested to undertake the ceremony of inaugurating the new-comer as royal mistress over a native stock. It will be seen, that the republican tribe did not at first submit quietly to the usurpation.

"... He (Mr. L.) first took away the Queen from a colony, driving off the bees that followed her, and when they had become uneasy and anxious from the loss of their Queen, he presented the new Queen at the entrance of the hive, in which were the bees which had adhered to the comb, and those that had returned from abroad. She entered immediately, but was instantly surrounded and enclosed by a knot of bees, and uttered a shriek of alarm, which caused Mr. Langstroth to disperse the bees and catch her, for fear she would be smothered. He then introduced her in the wire cage, in which she had been sent, and hung her in the hive, permitting the whole swarm to return. He left her in this way perhaps half an hour, and as they appeared to be feeding her, then released her among the bees, who appeared to be now more willing to receive her. This was about 12 o'clock. After dinner, at 3, Mr. Langstroth started home.

Mr. Rossel, the beekeeper, after this went to the hive, took off the honey-board, and found the Queen on the bottom of the hive, running as fast as possible, the bees pursuing her, and she squeaking. She ran out in front and took wing, but as she rose above his head, he fortunately caught her, and clipped her wings. He then sprinkled the hive with peppermint water, and as the bees in a few moments appeared quiet, gave them the Queen again, and they received her very peaceably. The next morning, he examined the hive, and found her upon the comb "all right." Mr. Pierce writes further:

"We now attribute the trouble to the fact of Mr. Langstroth's cleansing some wax from his fingers with turpentine, just before he handled the

Queen, and they retained the scent, although he washed them afterwards in clear water. We have found, if bees are robbing a hive, and the owners are dispirited, that a little whiskey, sprinkled upon the floor of the hive, so excites and enrages them, that they at once fight furiously, and kill every robber they can lay hold of. The turpentine doubtless has the same effect, and the queen being scented with it, was very offensive to the bees. I have entered into this detail, presuming you will be interested in our method and success, and also that you may have additional proof of the delicacy of the bees' olfactories, and the danger of offending them in this regard"

Why do Italian Bees Remain so Popular?

It is undoubtedly the case that various strains of Italian bees are the mainstay of commercial beekeeping throughout the world. So why have they remained so popular and why have beekeepers kept faithful to bees of Italian origin?

Perhaps the last word should go to R.O.B. Manley who is renowned for his success in commercial beekeeping and whose books have been an inspiration to would-be commercial beekeepers.

In *Honey Farming*³ – first published in 1946 – he writes: *'Italians and their crosses for me every time. You know, whether we like it or not, we have most of us to use cross-bred bees, and the Italian crosses are the best crosses in my opinion. My counsel is to aim at pure 3-banded leather-colored Italian bees of a good strain. You won't hit the bull's eye every time by a very long way, but you may come near it even when you miss. All over the world honey producers use Italians and it would be foolish to suppose that they do it because these bees have pretty coloured tails. I remember when I was younger and more innocent than I fear I am now, I was much surprised on visiting the apiary of one of our notables who was never tired of holding up for our admiration the great qualities of the English blacks, to find all, or nearly all the hives stocked with Italians, and very yellow ones at that.'* **BC**

¹reprinted by Northern Bee Books, 2010

²published by Northern Bee Books, 2011

³republished by Northern Bee Books, 1985

SPIDERS

Not to be afraid of, but to be aware of.

Jennifer Berry

Ever since I was a little kid, bugs have always fascinated me. This, of course, drove my mother nuts because I wanted to bring a variety of these six and eight-legged creatures into the house for closer observation. Mostly, she didn't approve of my extra curricular activity because she was terrified of both insects and spiders. Over the years, I have slowly and with much effort, tried to extinguish her fears. She can now, at least look at a beetle, praying mantis or spider without immediately going into what I call the "spider dance." You know the one; I'm sure you've seen it or perhaps even done it yourself. After seeing something you think is exceptionally creepy, your body begins to wiggle uncontrollably. Your arms start flailing. You are running around erratically, bouncing off walls and furniture, all the while making a strange, high-pitched screeching noise! After the fact, I think some people take pride in their own version of this dance, while others are simply embarrassed.

For a kid with such enthusiasm for bugs, a farm was the place to be. Each day it seemed there were numerous critters to seek out and investigate. As for spiders, we could always find them. Barns, sheds, root cellars, silos, fences and garden rows were perfect places. There were big ones, small ones, brown ones and green ones. You could find them in webs or on the ground. They were always plentiful. But the home run, so to say, was finding that giant, black and yellow garden spider, a.k.a. the writing spider, usually in between the rows of corn. As kids, we would dare one another to run down these long rows without stopping or swerving to miss the large webs. After one row, we were usually done. There is something about having an entire sticky web clinging to your face, hair and body, or, even worse, when it included the

unlucky spider struggling to stay in her web, that can send shivers up your spine. Garden spiders do bite; while they're not poisonous, they can make you wince in pain. I'd probably want to inflict a little pain on the one who destroyed my home, too!

Speaking of spider bites, an urban (or suburban) myth about spiders is that they bite people at night while they're sleeping. Folks who find a two-pronged (or single) bite mark on their body in the morning immediately jump to the conclusion that it is a spider bite. Actually, most spiders inhabiting our homes are of the smaller variety whose fangs are too short or too weak to puncture human skin. To have such a wound, one would have to have been bitten by one of the larger varieties of spiders, like tarantulas, garden spiders, giant night spiders or wolf/timber spiders. Simply, this is very unlikely. What is much more likely is that other insects are to blame, such as flies, mosquitoes, fleas, mites, ticks or bed bugs.

Think about it. For a bite to be visible, you're talking about a pretty large spider. Are these really crawling around in your bed??? Are there gangs of spiders convening in bedrooms at night just waiting for their human prey to start snoring before pouncing on them and feeding until sunrise? Spiders have no motivation to bite humans because, first of all, we are too big for them to consume, and, second, they don't want to waste venom on us. Each time a spider discharges venom, it can take up to two weeks for the venom to be regenerated, which means the spider goes hungry until then.

My enthusiasm for spiders has not waned over the years even after hearing a pretty creepy story about one particular species. Several years ago, we had an extension agent from Tennessee deliver a seminar talk for our Entomology Department. It was

one of those talks that I'll never forget, but some of the details may be a bit fuzzy. It was 1998 when he spoke to our department.

Built back in 1929, the Georgian-styled, governor's mansion in Tennessee had slowly deteriorated over the years and was in need of major repairs. However, the governors were a bit wary about making those repairs since it would have required the use of state tax dollars, which may have displeased certain voters. With widening cracks and crevices, it provided the perfect home to many unwanted pests.

One night, during a dinner party, a guest of the governor noticed a spider swimming in the punch bowl. The spider was quickly scooped up and saved for later investigation. The next day, the spider was taken to an extension specialist and identified as a brown recluse, which are found in every county in Tennessee.





A Brown Recluse spider.

The brown recluse, or violin spider, is a small (7-12 mm) brown spider with a dark patch, which may resemble a violin (hence the name), on the cephalothorax (the head and thorax are fused together in certain subphyla of arthropods). The eight legs are lighter brown, and the abdomen is darker brown or even green. Nocturnal feeders, brown recluse spiders prefer the darkness of undisturbed places, like under furniture. Since staying out of sight during the day is their habit, they love to nest in that old pair of boots stored in the shed or that Winter coat hanging in the back of the closet. They are not aggressive and rarely bite unless provoked, for instance, when pinched between a body part and another surface. A toe pushed into a shoe, or an arm pressed against a garment or mattress, is a typical example.

The governor was advised to have the entire mansion fumigated in order to do away with these pests and the possibility of being bitten. However, the governor's wife was heavily involved in environmental issues and wouldn't allow the mansion to be fumigated with any kind of pesticide. As an alternative, as well as in an effort to quantify the infestation level and locate breeding areas, hundreds of sticky traps were placed throughout the mansion. These sticky traps were 12" x 12" cardboard squares with glue on the upper surface. Anything walking across one was sure to get stuck.

From the attic to the basement, traps were placed under chairs, couches, tables, beds, dressers, and sideboards. They were put behind furniture and pictures, plus in corners, bookshelves, and cabinets. Twenty-four hours later, as the traps were

being collected, the extension agent became terribly disturbed. Each trap was completely covered with brown recluse spiders. And, these were not just the traps in the more remote locations, but also the ones under the bed where the governor and his wife slept, the couch where their children played and the kitchen table where they all ate together. This was not good. This was not good at all! Yet, the most surprising thing was that no one had ever been bitten even with all these spiders roaming around.

The bite of brown recluse may go unnoticed for several hours or even days. Depending on the amount of poison injected and the sensitivity of the person bitten, there can be a wide range of symptoms. The poison from the spider causes necrosis (death) of the tissue adjacent to the bite area. Other symptoms include fever, itching, nausea, vomiting and shock. Long-term effects are scarring at the bite site, kidney insufficiency and even death (less than 3%). But, the brown recluse, along with their other eight-legged cousins, may be getting a bad rap according to our departmental spider expert, Dr. Nancy Hinkle.



A Black Widow with her obvious red spots.

When a patient presents an unexplained, dermatological wound to their doctor, spiders, especially the brown recluse, seem to get the blame, even when the spider doesn't exist in the area. For example, according to Rick Vetter, Urban Entomologist for UC Riverside, in 41 months, 216 brown recluse spider bite diagnoses were made in California, Oregon, Washington and Colorado. Yet, these are all states in which the brown recluse doesn't reside! Medical person-

nel are even quicker to misdiagnose any type of necrotic wound as the result of a brown recluse. In fact, such wounds or infections have likely been caused by a bacteria, virus, fungus, or vascular disorder than by spider bite. Though, I concede that, "You've been bitten by a spider," sounds a whole lot better than, "Sorry, Miss. You've been infected with a flesh eating bacteria."

The brown recluse's native range is from Central Texas, east to Western Georgia, north to Kentucky and west to southern Nebraska. Here, in the Piedmont region of Georgia, brown recluse spiders are rare to none. However, we have another spider that is very common, especially under beehives.

The black widow spider has been so named because, after she mates, she usually kills and consumes her male suitor. So, throughout history, the black widow spider has gained an ugly reputation as a bloodthirsty maniac, wandering the streets in search of her next victim. This is not quite the case. The reason that female spiders, along with other insects in the wild kingdom, post-coitally devour their mates is for the survival of the young. By eating the male, the female acquires nutrients important for the development of the eggs she will soon deposit and protect with her life.

The black widow is a skinny, black orb-weaver spider with long skinny legs and a distinguishable, red hourglass-shaped marking usually on the underneath of her abdomen. However, not all black widows have this red hourglass. Some may have yellow, orange, or red spots, dotting areas on the top or bottom of their abdomen, as well. Black widows, like the brown recluse, prefer areas that are dark and undisturbed. Outside, they are commonly found under rocks, in woodpiles, hollow stumps, and abandoned rodent burrows. They are also fond of those dark corners, cracks and crevices found in sheds, garages, basements and crawl spaces. But, in the beeyard, especially here in Georgia, black widows love the cozy underbellies of a beehive. With available food, warmth, and protection from the elements, what better place to call home? However, we never apply any kind of insecticide in or around our hives to kill spiders.

Here at the UGA lab apiary, most of our colonies sit atop cinder

blocks or horizontal, 4" x 4" fence posts. During the Spring and summer months each hive, including the stored equipment as well, will have at least one black widow as a resident. It's crazy. Even the horticultural farm crew (with whom we share the farm) complains about constantly finding black widows in their storage sheds, pump houses, empty pots, and soil bins. A few years back, we were moving some nucs (nucleus hives – four or five-frame starter hives) off-site. I was carrying them to the truck and handing them over, when one of our grad students said, "Um Jen, I think you have a black widow crawling up your shirt!" Sure enough, there she was.

The black widow spins a very unorganized, erratic web, unlike the orb spiders with their classic, spiral, wheel-shaped home. The web is very sticky and will snare most unaware insects that come too close. Once snagged in the web, the black widow will quickly spin a silken cocoon around her victim. When feeding, she punctures the insect with her fangs and administers digestive enzymes which liquefy the prey's internal structures, so the contents or body juices can be easily sucked out. Yummy!

Black widows are common and widespread across the U.S. Yet, there are very few reports of actual bites from black widows, and no one has died in over 10 years from these most-feared spiders. But, if you are bitten and venom is injected, you will probably need to be admitted into a hospital. At first, the bite area will resemble a target with a pale area in the center surrounded by a red ring. Within a few hours severe muscle cramps will develop along with headache, nausea, vomiting, breathing difficulty, weakness, itching and increased blood pressure. The very young, elderly and infirm are at the highest risk of developing life-threatening complications.

With that said, I know of someone who was bitten on the toe by a black widow as he put on a pair of boots, which he had left outside over night in downtown Athens, GA. He spent several days in the hospital receiving morphine to ease the pain. So, while being bitten may be a rare likelihood, I keep my eye out when handling equipment (either in storage or in the field), gardening,

moving rocks (which I do a lot), and hauling firewood because I don't ever want to have the type of pain that necessitates that much morphine administration.

As the picture shows, we also occasionally find black widows in the handholds of our supers. A certain amount of caution should always be taken while working bees. From not letting a hot smoker burn down the apiary or honey house to not becoming overheated or dehydrated. It is just as important to keep an eye out for the occasional poisonous spider, snake or charging hippo (which are always dangerous this time of year)!

Spiders are probably some of the most misunderstood of all the animal groups, which is a shame since they are extremely beneficial to us and the environment. In a way, it's much like how the general public reacts to the buzzing sound of bees; they tend to run screaming while swatting wildly at the air (a variation of the spider dance)! But, at least people are becoming aware of the importance of bees, due to all the media attention during the CCD scare. Spiders, unfortunately, are still left in the wings with no hope of better favor in sight. I just can't imagine there being much of an outcry if, all of a sudden, spiders began dying off in droves. However, it wouldn't take long for us to notice the increase in insects, especially the ones that invade our homes and food supply. So, the next time you



A black Widow, resting on the brand on this hive.

see a little spider scurrying across the floor, and before you drench it with insecticidal spray or make it a permanent fixture on the bottom of your shoe, you may want to recognize it as an amazing creature with its own important role to play. Try picking it up with a sheet of paper, releasing it outside and letting life happen. Just a thought. **BC**

Thanks again to Philip Quinn for repairing grammatical issues within this article.

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

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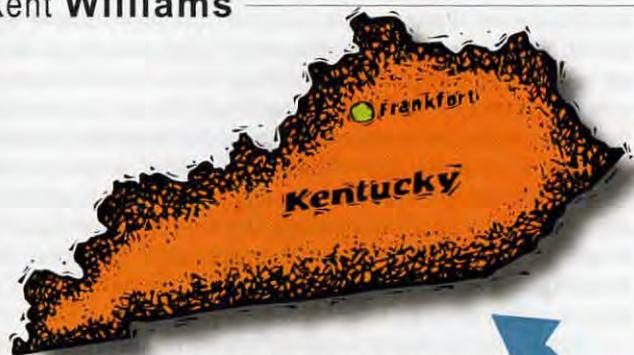
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Bee Business In Two Places

Kent Williams



*If You Choose To Move,
Know Why, Know How,
And Know When*

Questions that should be answered; Questions to answer

1. Will the venture be economically feasible, given fuel prices and current product prices?
2. Will the venture be logistically feasible; i.e. can necessary work be accomplished in a timely manner in both locations without adversely affecting family life. Keep proper priorities throughout.
3. If the venture is not feasible with X number of colonies, will there be an "economy of scale" at some point. Will a larger operation balance the equation; and if so, at what number does the scale begin to tip? Will an expansion require hiring labor in order to properly manage the business, and how much will this move the goalposts?

Why Would You Do This?

This is the most asked question I hear. As with most areas of beekeeping, there are several answers, none exactly right or wrong. The first two answers have their roots in finances, which is actually the basic reason for the very thought of spreading a business by adding distant locations. Why else would a person do this...for kicks??

To produce a product or provide a service that cannot be produced or provided by remaining in the original location. This includes producing varietal honey – or maybe just surplus honey; providing pollination and needed staging yards; being far enough South to take advantage of an early spring build-up for the purposes of either producing bees for sale, readying colonies for pollination or an early honeyflow; rearing early queens, etc.

To spread the risk of a poor season in one particular location.

The spouse is especially hard to live with and being on the road a lot is actually a nice break, for everybody.

Once these questions have been answered, and assuming there is a decision to operate in multiple locations – and there has also been a decision as to where the yards will be located, the next question is...

How Will You Do This?

The physical part of "how" is simple; the bees are loaded onto a truck or trailer and transported to, and placed at, the new location. Of course this is greatly simplified compared to reality and the nuances of the

process of establishing a new beeyard.

Some of these nuances may involve making contacts and beginning relationships with landowners to gain access to properties where the bees may be placed. There is also the option of purchasing land for the purpose of placing bees on the property. The place to start is with current acquaintances. If the desired location is – for instance – Georgia, is there an acquaintance that has connections in the area? If this search is unproductive, the next option is to contact the county Extension Agent responsible for the desired area. I have found Extension Agents to be very good resources when unfamiliar with an area. Understand that there is a cost of some sort to everything. It is also possible the landowner might be happy to have bees placed on the property – but he is thinking four colonies while the actual load is 400. If there is a dollar figure on the table, so to speak, this must enter into the overall equation for the venture, and may adversely affect the balance.

Do not wait until a physical location has been found and an agreement reached, and the bees prepared to move to consider the possibility that there may be inspections required before the move. Make certain of the regulations for the area in question before locating property, agreeing





Make sure your transportation is adequate. Breakdowns are expensive, and dangerous.

to terms etc. KNOW THE REGs. It is much easier to learn the rules and work *with* the regulatory agency than to try to work *around* them.

Make a business plan each year. The plan does not necessarily have to be followed to the letter, but it will be a good tool to help streamline your thought processes and keep the proper focus on the main objective.

When making a plan, be “forward looking” in planning specific work. If it is possible that the hives will need to be supered in three weeks, do it now to create free time in three weeks, rather than waiting until two weeks and six days, then loading supers and driving all night to discover the honeyflow was a week earlier than anticipated and the hives are all honeybound, queenless, or both.

On each trip to the “long-distance” yards, make at least a cursory inspection. Remember to “keep the main thing, the main thing.” Primary inspections need to deal with the truly important items. We are most interested in these issues; •Is the hive queenright? •Is the hive healthy (free of disease and serious infestations of pests/parasites)? •Is there enough food stores? •Is it honey bound? (does the queen have plenty of clean, empty cells in which to lay eggs – in the broodnest. •Is there plenty of room for expansion?

These things can be discerned by an experienced eye in less than five minutes per hive. Do everything with purpose; know what to look for in a hive, and when it is found go to the next one.

When executing the plan, be flexible enough in thinking to be comfortable with altering the plan to take advantage of previously unthought-of opportunities. Generally speaking, this attitude should not alter the primary focus of the plan, but should be a mechanism for feeding the business by enhancing the bottom line. A good example is when a queen-rearing operation is forced to take action to alleviate a honey bound condition in hives. If the honey is extracted and sold, the sales will have a positive effect on the business as a whole, while the main focus is enhanced by alleviating the honey bound condition.

As the saying goes “plan your work and work your plan” – BUT, if there is a financial opportunity that had gone under the radar, take advantage of it. Make the bees

produce income in every possible way. The only sales opportunity that should be passed up is that of selling the base-stock. It may be tempting to pare down the operation when confronted with someone with cash-in-hand wanting to purchase 20 singles – remember, these constitute the base for building and producing more bees, queens, providing pollination, and producing honey for the business. If the base is sold off this year, where will the build-up come from next spring? Do not take a chance on recovering numbers by splitting late in the season. A non-existent Fall honeyflow can really trash the bottom line when it becomes necessary to pour a hundred pounds of feed into each late split. Placing the operation in a “must have” situation by being totally dependent on late splits to recover colony numbers carries the likelihood of causing much unneeded stress – both mental and financial. Mr Murphy wrote a law concerning such thoughts. Play it safe, leaving as little as possible to chance.

When formulating a plan, take into account “real world” estimates on labor and capital needs. Overestimate needs and underestimate personal ability to meet those needs. Be sure to leave some amount of cushion for all the things that will go wrong. Back off one complete brood cycle or one queen-cycle when estimating the first production date. Also, when ordering breeders, packages, nucs etc. take into account the fact that the producer being used is affected by the weather and the afore-mentioned Mr. Murphy the same as the rest of the beekeeping world – be understanding if dates are backed up. Next time it may be *you* getting the “where are my bees” phone calls.

One last consideration is that of tax and insurance liabilities. If operating in multiple States, there could be tax liabilities to be met, especially if hiring local labor. Along with and akin to these tax concerns are insurance liabilities. The issue of insurance is valid regardless of the locations of the business venture, again, especially when using hired labor. Be smart and seek professional advice. If seeking advice for an out of State operation, seek advice in the locale of the business. An expert in Ohio may not be familiar with Georgia statutes.

In this same stream of thought, when depending on hired labor, the business venture will have the same ratio of success as the relationship built between owner and employees. Somehow, over the years, the professors teaching business school have completely dropped the ball on the importance of the owner/supervisor/employee relationship.

If the owner (you) is planning to be two States removed from the business for extended periods of time, and wants the business to roll happily along, the owner had better treat the employees better than he or she would treat themselves or their own children. Establish the relationship with employees by making it clear from the date of hire that the wages offered will be premium, BUT the quality of work is expected to be premium as well. We make our employees actual partners in a percentage of the business, if they so choose. We do offer as a second choice to pay hourly wages, but the percentage partnership is much more attractive in the long run. I seldom brag about our business and almost never my personal contribution to the business, but our employees are loyal, and devoted to achieving the utmost quality from their efforts. I can never say enough about the quality and work ethic of our

people. I believe this is due to the fact that a rock solid relationship is established with each employee from the first day we meet. This makes me totally confident and comfortable in leaving a monumental job in their care while I attend to other aspects of the business.

The progression of our business

Our initial desire was to have a complete brood cycle with a queen in full production before our primary honey flow of Black Locust, Tulip Poplar, and white clover – around April 10. We began our efforts to achieve maximum production by making our focus having real “boomers” by April 1. The method we settled on was to build colonies in East Texas, then move them home to Kentucky around the first of April. This worked well, but through circumstances beyond our control we lost our contacts in Texas. This led to making contacts and establishing permanent yards in South Mississippi. Over the years our business has changed into a multi-faceted venture, rather than being concerned only with honey production. We gradually have become very near self-sufficient by becoming competent in most aspects of beekeeping, and eventually training others in our work force to become proficient in their area of responsibility.

Our business now produces honey, bulk bees, queens, nucs, and provides pollination. This journey has taken about 20 years, and has not made any one of us associated with the business wealthy – but we all eat well and keep our bills paid.

During the course of this time period, we also had a beekeeping operation in Northern Ontario Canada. This is where I learned first-hand the object lesson of being certain the business is logistically feasible. We produced a really good average poundage of fireweed and sweet clover honey from our Canadian bees . . . but in order to make

the venture work, a knowledgeable beekeeper needed to be present from May through September. There were no locals that had any prior beekeeping experience, and none that were interested in learning. This translated into a lot of miles on my truck for the three years we were in the Northland.

The positives for the Canadian operation were honey production and quality, plus a mite-free environment (at that time). The negatives were 23 hours one-way drive time, and very quick seasonal changes, which dictated immediate management. In the end the negatives outweighed the positives because the Mississippi yards were seven hours from home and produced not only a good surplus of honey, but early bees, brood, and queens as well. However, I do still dream a little about Canada.

To summarize, to do business in two places it is helpful – maybe even necessary – to do the following:

- Have a definite business plan, with a clear focus.
- Work purposefully toward that focus
- Stay one season ahead of current needs in thinking and action.
- Build your business on principle and solid relationships...and do not compromise either for the sake of a dollar.
- Do everything you can for yourself; but don't hesitate to hire part time or even full time help if the business can justify the cost vs return. Still, as much as possible should be done “in-house.”
- Don't become so caught up in distant business ventures that your own dog doesn't recognize you when you return home. **BC**

Kent Williams is a commercial beekeeper with operations in Kentucky and Mississippi. Fortunately, we are told his wife, Valerie is very easy to live with.

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Commercial Queens

The Third In This Series • First – what is a good queen.
Second – equipment needed. This Time – all about bees.

Dann Purvis

This is the third article on a mid-level sized queen production operation. The first two articles defined what we believe is a good queen, some proven business concepts and values, what kind of equipment you will need and what a possible schedule would look like. Further, we covered the best way to feed donor hives, mating nucs and finishers, and reported approximate yields that you can expect. The model being used is based upon a 100 hive/500 mating nuc operation. This number was picked so that a potential queen producer of a larger or even smaller size can estimate accordingly. It should also be noted that this article corresponds with the third month (March) of what I consider the start of a new queen production season. For this third month, the tasks and subjects are many. The following list covers some you will certainly see:

Major Tasks for the Third Month

- Continued feeding
- Taking deposits/orders
- Positioning of hives

- Shaking bees
- De-miting bulk bees
- Setting up finishers (will cover in the next article)
- Grafting (will cover in the next article)
- Cell handling (will cover in a future article)
- Establishing mating nucs (will cover in a future article)
- Setting in mating yards (will cover in a future article)
- Setting in drone yards (will cover in a future article)

Continued feeding is very important. Even though you might be seeing a natural flow by now, you don't want to lose the momentum of the spring build up. I strongly recommend a continual light syrup feeding of any bees that you triggered early for brood rearing, and during any time that you are harvesting brood or bulk bees. Also you should make available dry protein in the form of pollen substitute powder, preferably by open-yard feeding. Another good reason to continue feeding the earlier-stimulated colonies during this and the next month is to thwart the possibility of starvation. Here's why: These hives are strong, producing large amounts of brood, and therefore consuming huge amounts of stores. The natural sources of nectar and pollen may not be enough to match the artificially stimulated hive's needs. You must ensure that they are continually provided for during this time of huge demand. Don't gamble on natural resources, ever.

For the third month, the tempo of customer orders will increase as well. We have found that **taking deposits on your orders** sorts the wheat from the chaff. Sometimes folks will make an order and have nothing in mind but using you as a back up plan should a "cheaper" opportunity arise. To stop this and other likeminded shenanigans,



This is a shaker assembly ready for a hive body of bees. I will usually find the queen first, cage her, put her in the shade and then shake the bees off the frames. I use the excluder in the early Spring when multiple queens can be found in one hive. I will sometimes skip finding the queen in the hive first and find her after I have shook and smoked the bees through the excluder. The excluder can be attached and should be bee tight to keep from losing the queen which is attracted to dark corners.



Shaking bees! The deep hive body going on top has the bees in it. The bottom deep is empty and has a queen excluder between it and the funnel to filter out any queens. Notice the funnel going down into the bulk bee box.



Here you see three types of funnels which you can use to collect bulk bees with. These are all steel but some are made of fiberglass.



Close up of a bulk bee box with the door closed. This design does not have legs so I use bricks to elevate it when I de-mite the bees. Notice it was made with an old deep hive body.



This is a different design and shows an aluminum door that slides. A little too fancy for my taste but something to think about. Also, this box is larger than a deep hive body.

gans, we simply take a 25% NON-refundable deposit for each shipment/order no matter how many queens are ordered. The sincere folks farther down your "first come-first serve" list of buyers are the ones that suffer the most if you do not protect them by handling this with diligence. Also, when I say non-refundable, I am not implying that you simply take money and never give it back under any circumstance. If you can't produce the queens within a reasonable time, you refund. We usually work within a month window to account for nature and unforeseen obstacles. Likewise, I recommend STRONGLY that you do not spend the deposit money until after the customer has received their queens. Remember, you are producing a biological organism, not a widget. As we all know, things with nature can be very unpredictable. Make sure your terms are clearly explained to your potential client. We have the terms posted on our website.

When running an operation such as this, **positioning your hives** in a timely manner and in the right location is almost an art-form. You must be efficient and effective. It is a balancing act and I have some suggestions to make it much easier. First, let's remember two beekeeping basic truths that will make things more understandable:

1. Strong queen-right colonies are more attractive to bees than small queen-less colonies. Since a few of your newly established mating nucs may not be queen-right (no-takes) and may not have any brood to keep them "locked in," keep mating nucs away from any full strength hives at least until they are well established.
2. Bees will return to their old hive location if they are oriented to it. Bulk bees that you collected (shook) earlier, that are within flight recognition distance of the donor hives will naturally want to fly back to the hive that they are oriented too. This can work as a curse or a blessing in that young hive bees have not oriented while older field bees have. You can use this to your advantage by filtering out the more aggressive field bees for some future applications such as supplementing a starter/finisher or weak hive.

Ideally, you want to move your hives as few times as possible. At the same time, it is possible that you have at least one of your mating yards in the same locale as your starter/finishers. We call this our Home or Lab yard. If you are not going to run anymore than a few hundred mating nucs, you can do all three cycles, graft and have your drone stock in the same flight area. This is not the

best way to do it until you have a better understanding of just how much of a load your local area can handle, have learned how to feed bees so that they will maintain your drone stock, and have learned the techniques of using "in-yard bees." After collecting or shaking bulk bees from a yard, move these donor hives (which are likely to include your selected grafting queens and drone stock) to their final site, which will be located in a new flight area and likely a new mating yard. Bottom line: Most mating nuc establishment problems occur due to bees not staying in the nuc. Good planning and forethought will overcome this issue.

Shaking bees is what I call the process of collecting bulk bees for use in packages, supplementing finishers or weaker hives, but mostly for making up mating nucs. The following are some invaluable points that you can use when shaking or collecting bulk bees:

- Remember this one thing more than the rest concerning the collection of bulk bees: HEAT is a killer.
- A strong healthy single colony, during spring buildup that is fed well and headed by a good queen can provide up to 3 pounds of bulk bees every 3 weeks on average.
- Queenless bulk bees use up lots of energy, produce a lot of heat, and are under extra stress.
- Wet bees or bees that are full of honey are heavier, require slightly more space, are more gentle, but are more sensitive to heat and rough handling than dry bees.
- DO NOT spray bulk bees with sugar syrup unless they are starving, and don't overdo it if you must.
- You can cool them down with light water spraying and even ice during extreme heat.
- Use your bulk bees the day after you collect them.
- Keep them out of direct sun at all times once you have collected them.
- Keep them in a well-ventilated (fan), cool (air conditioned), dark location until you are ready to make up your mating nucs. The size of the storage location needs to be spacious enough to prevent overheating unless you can provide sufficient air conditioning and/or fan(s). Enough bulk bees confined in a small room can get hot very quickly. If done early enough in the season, the cool days and nights and an unheated building may be adequate.
- Provide a full feeder of thin syrup to the collected



Several pounds of over heated bulk bees laying in the grass. Notice the fan. I was able to save most by catching my mistake early and rapidly dumping them onto the ground, spraying down with a water hose and then using a fan. After about ½ hour, I laid small brood frames on top of the bees to collect them after they climbed back on. It can happen to anyone – watch the heat with bulk bees.

bulk bees and the donor hives.

- Smoke the hives well before you shake from them to get the bees to soak up as much honey as possible.
- DO NOT overpopulate your bulk bee boxes. I recommend a maximum of 1/3 full. It is much better to have them spread out over several boxes instead of just a few. Killing 25 lbs. of bees due to overheating can set you back close to \$1,000 in gross income not including the cost of the bees. Be very watchful of your bulk bees.
- It is not best to expose the newly collected bulk bees to open cell drawn comb because you want them to hold the honey and syrup in their guts. This way, the wax glands will be going full force by the time you make up the mating nucs.
- Learn the technique of shaking bees from a frame into the funnel. Do not use a bee brush. A blower is another possibility, and we have done it that way, but I still find that shaking them off of the frame is the least stressful on the bees (and I don't have to take another piece of equipment to the field).
- A good wire queen excluder to filter out any queens (multiple queen hives are real) is beneficial in that your bees will definitely be in a queenless state and more manageable when you make up the mating nucs. The only down side to this is, it will also filter out drones which I prefer, not require, to have in the mating nucs. Use smoke to "push" the bees through the excluder and help corral the bees.
- Try to shake all hives within a yard to more or less equalize them, if you are in a dearth, to cut back on robbing potential.
- Shaking the bees between 11:00 am and 3:00 pm when the field bees are foraging is preferred. I get a larger percentage of younger bees for my mating nucs and the donor hives are keeping a larger percentage of foragers in this way.
- If you have a choice, try to shake during a sunny day versus an overcast day for the same reasons as the last point.
- Watch how cool the nights are, to give you an idea of how many bees you can harvest from the donor colonies. Frames of capped brood will hold and produce some heat and are not as sensitive to heat as queenless bulk bees. Chilling is more of a concern for the frames of brood in freshly shook donor hives, whereas heat is a concern with queenless bulk bees in bulk bee boxes.

Just how many bees you can harvest from a hive is one of the toughest things to put into words. There are so many variables and you will learn through experience just how many bees you can harvest from a colony without causing damage. Damage caused by shaking too heavily will show primarily in the form of chilled brood. Potential Small Hive Beetle (SHB) infestation increases as well if the frames of brood (protein) are left uncovered from attending bees for too long. Several factors contribute to how many bees you can harvest from a donor colony: how cool the nights are, SHB load, if you collect during a flow or not, if you collect bees during a sunny or overcast day, if you are feeding or not, old queen or new queen, and genetics of the queen, to name a few. As always, when in doubt, copy nature. Most hives will not swarm with more than 60% of the colony, and that is during the seasonal time in which the nights are warm enough that a less-populated, newly swarmed hive will not experience chilled brood. Therefore, do not harvest more than 60% until you learn what you can get away with, and don't do it if it looks like the upcoming night temperatures are going to be unseasonably cool (40's or below). Back in the days before SHB with warm Summer nights, I could shake every frame during a flow (in the middle of the day), and simply flick the queen back into her hive, thus leaving almost no bees for her. I would come back in a few days and it would look like the hive had not even been shook. Folks in the North might still be able to pull this off later in the season but if you try that in the South, you might end up with a nice colony of SHB maggots as a result.

Mechanically removing mites from your newly collected bulk bees that you'll be using for mating nucs is an effort that will pay you in extended season production, higher queen yields and more vigorous nucs. We use powdered sugar and call the process **de-miting bees**. The key to this simple and effective technique is focused around the bulk bee box. We make our bulk bee boxes out of old deeps that have the very bottom one inch or less rotted away. We rip saw away the rotted wood and attach #8 hardware cloth to the top and bottom of the box. We add legs and a hole that fits the funnel. Finally we add a door to make up a bulk bee box that is standardized, cheap and manageable.

Once we have the bees in the box, and they are calmed down for a couple of hours, we turn the boxes on the sides so the screens are on the top and bottom. There is about a three-inch gap on the bottom because of the legs. This provides for better ventilation. Then we pour directly from the bag enough powdered sugar to cover all the bees. Shortly, the clusters will fall apart and the bees will start roaring. They are now in the process of cleaning themselves off and forming back into a cluster. Later, you can see all the dead mites in the sugar below. Don't bother counting the mites, which is a waste of time. Also, don't think that you can powder the bees several times and do a better job. This will just unnecessarily stress them. And if it is hotter than 90°, don't even bother de-miting them at all. Also, I wouldn't recommend de-miting right before placing the bees in the mating nucs. They could overheat in the confinement because of the increased agitation and activity. **BC**

Well that's it for this month. Check back next month for more on mid-level queen production. www.purvisbees.com, rosanne@purvisbees.com or purvisbeesinfo@gmail.com, 931-852-3033, Box #100, Leoma, Tennessee 38468

WINTER KILL

It's already March and almost too late but even last minute repair and replace activities will help this Summer.

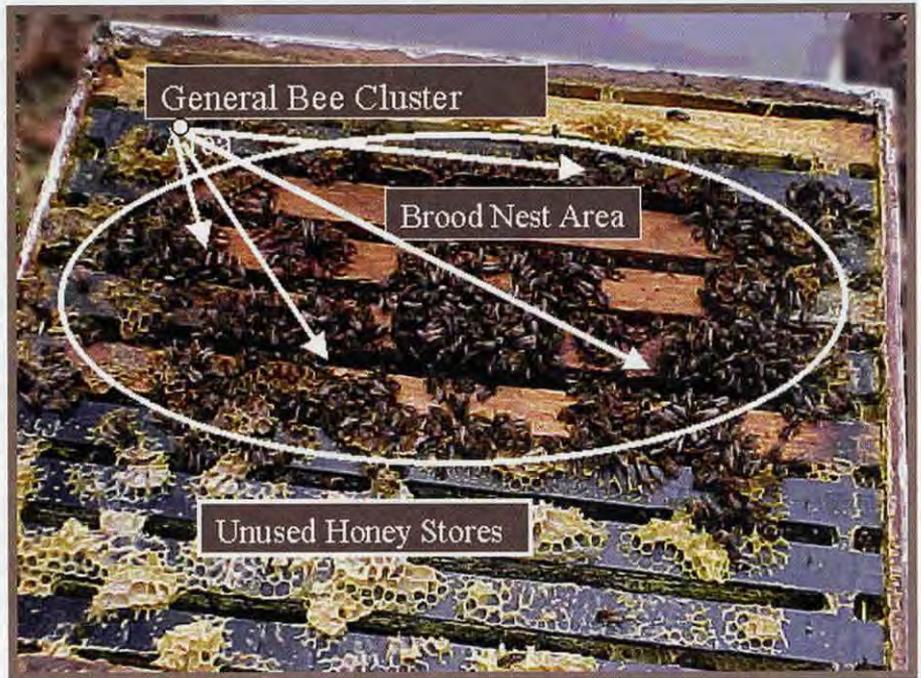
James E. Tew

Winter-killed colonies have become a common aspect of beekeeping. It seems that no matter how dedicated an effort one makes, there's always a colony that insists on dying. As has been discussed in innumerable articles and various talks, the increased number of bees dying during the winter has steadily increased to historically high levels. Until something big changes, I sense that this new level of winter die-offs will be (unfortunately) the norm. Beekeepers were told to implement the following recommendations for best wintering results. Even today, there is no harm and all good in implementing these recommendations, but the guarantee has been greatly reduced.

Some Traditional Colony Requirements for Successful Wintering

1. A young queen.
2. Honey stores that are correctly positioned. (Amount varies with location but generally 40-65 pounds of honey.)
3. Four - five frames of pollen near the brood nest.
4. Strong population of healthy bees going into winter (50,000+).
5. Basic hive manipulations performed (e.g. entrance reducer installed, inner cover reversed, and upper ventilation and upper entrance provided.)
6. Protected Location.
7. Mite control programs where needed, and on time.

During late Winter and Spring, for both new and experienced beekeepers, it's a common beekeeper question at meetings. "What did I do wrong?" Most of the time, it was something routine, like starvation or a queen dying, but sometimes good colonies just die and we will never know why. Diseases, pesticides, poor



The biological configuration of a healthy wintering colony.

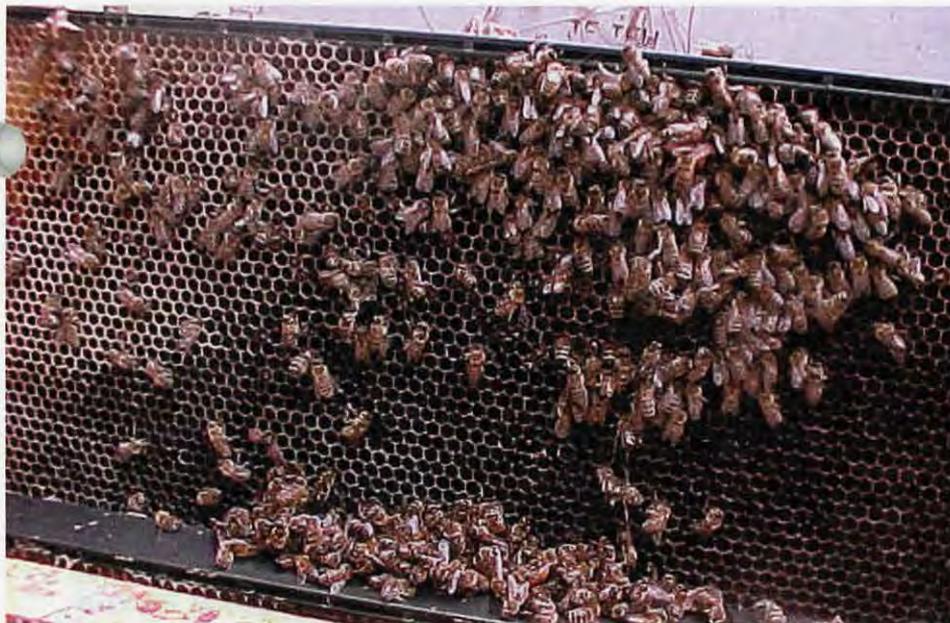
genetics, viruses, and who-knows-what-else, can all play varying roles in colonies dying. A particular colony looks good in the fall, but turns up dead in the Winter. Sometimes you just lose.

The Dead Colony's Autopsy. Wax Moths, American Foulbrood and Nosema

Depending on the location of the beekeeper, various procedures are required to recoup Winter losses. In warm climates the wax moth is a relentless taskmaster. The combs are often destroyed before the colony is completely dead. Warm climate beekeepers must be doubly alert or their problem is compounded - they have lost both bees and comb. In cooler climates, the situation is still bad, but not so urgent. The first thing a beekeeper should do with Winter-killed equipment is to determine what caused the colony to die. The

obvious concern is that spore-forming American Foulbrood (AFB) may have been the problem. If foulbrood has been a problem in the past the beekeeper should contact the state apiary inspector and have a competent assessment made. At times, Nosema is a problem. Unfortunately, Nosema is difficult to diagnosis and the remedy is somewhat expensive. Excessive defecation spotting is an indication of dysentery.





This colony died from starvation.

Mites

And there are always mites. *Varroa* predation continues to be the greatest challenge to ravage our industry. Weakened bees, dead bees, virally-infected bees – and general colony malaise make a colony a good candidate for becoming a winterkill. So far as is known and if American foulbrood was not the issue, a hive killed during winter months, or any month for that matter, can be safely reused¹.

¹Keep an eye on this general beekeeping adage. It's an okay recommendation for now, but I bet you it won't hold up indefinitely. As we learn more about viruses and comb contamination, I expect future researchers will develop an updated recommendation on this subject of equipment reuse.

An Absolutely Strange Aside . . .

Not all pieces that I begin to write successfully become monthly Bee Culture articles. Sometimes a piece just does not "taste" right or the theme does not develop. During September, 2007, I began a piece that was to be entitled, "Some bee things I just can't explain." When I started, I envisioned the piece being a short series of hive mysteries, but things became tedious and too negative. It never turned into an article, but in light of the recent Zombie fly issue, I have included a short segment of this never-published piece. I don't think my colony had these flies, but I am reminded that I don't know what I and the beekeepers who contacted me were seeing.

Quaking bee mystery

This past season (2007), several of you contacted me asking about shaking

Starvation

Starvation has distinct characteristics. The cluster will be in a tight (and dead) group, probably near the center of the colony with single dead bees scattered about. Upon removing frames from the colony, many bees will be seen in cells with their heads toward the center of the comb. Meager amounts, of any honey will be in the colony. Occasionally, patches of honey will be found scattered throughout the colony, but bees were unable to get to it before chilling.

Once the reason for the winterkill has been determined, the beekeeper must then decide what to do with the equipment. Diseased equipment

bees and whether or not an insecticide was involved. The few bees affected appeared to have a neurological problem that made them appear to be drunk. I have no idea if these bees recovered. At first, I thought it just to be one of those "bee things" but after getting three calls, I began to give it more thought. Later, I noticed a few bees in my own observation hive exhibiting what I suppose were the same symptoms. They staggered around looking purposeless and intoxicated. Otherwise, they looked fine. Within a day or so, the symptoms were gone. Again, I have no idea if the affected bees recovered.

Obviously, environmental or internal hive chemical contamination could be suspected, but I have no data to clearly say that. Occasionally, foraging bees work plants that have negative effects on



It's time for this box to get the loose paint scraped and the propolis cleaned out of the rabbit and off the frame lugs.

should be destroyed or sterilized depending on the disease pathogen. Colonies that starved should have dead bees shaken from the equipment and comb as much as possible. True, new bees will remove all the dead bees from the equipment, but critical time can be saved by assisting the bees with the task.

Re-Establishing Hives Spring Colony Splits

Most beekeepers want to restock their winterkill equipment. Several techniques are possible. Unless the beekeeper has had extremely bad luck, some hives probably survived the Winter. Depending on the

them. Possibly, a genetic problem is the answer. Is any of this related to Colony Collapse Disorder? Another big unknown is whether or not all surrounding colonies were affected or just a few bees in a few colonies. All I can say at this time is that this past season a few bees within a few colonies acted strangely and that the condition appears to have passed. I don't know what it was.

Other bees were crawling in front of the hive. I didn't know what it was then and still don't know what it was. This kind of mystery thing is not uncommon in beekeeping so it becomes difficult to determine when something is just weird and when something is the next big thing. We have learned a lot about honey bees, but we really still have a long way to go. Keep observing and reporting.

strength of the surviving colonies, bees and brood can be taken from surviving colonies, along with a new queen, and put in refurbished winterkill equipment. The strength of the split is an arbitrary decision the beekeeper must make. The stronger the split, the more likely the colony will survive next Winter. However, the stronger the split, the more likely the beekeeper will not get a honey crop from the original colony.

Provide Mated Queens

I strongly suggest placing a mated queen in the re-established colony as opposed to letting the bees produce their own. If winterkills have been a problem, one should do everything possible to improve his or her techniques for the next Winter. Too much time is lost during the nectar flow if bees are required to produce their queens. Brood and bees from several colonies can be mixed to form a new colony. Smoke or some other disruptive agent (air freshener or newspaper barriers) should be used to mix the bees from different colonies to minimize fighting.

Buying Package Bees

Another common technique for restocking hives is to purchase package bees. This is a simple and proven procedure for getting colonies back into operation. Package producers, listed in the bee journals, should be contacted as early as possible in order to book the arrival date most convenient for the beekeeper. Colonies that survived the winter in a weakened condition, but alive, can be boosted with the addition of a few pounds of healthy adult bees. Contact individual package producers for the details on queenright or queenless package purchases.

Buying Colony Splits

Colony splits have the advantage of not having the "Post-Package Population Slump." This occurs after a package of bees is installed. Since no brood is present in a package bee colony, the adult population declines until new bees are produced by the colony. Alternatively, colony splits, having all stages of brood present at the outset, do not show this characteristic population decline. Subsequently, the split colony builds up faster and is better prepared to withstand the upcoming Winter.

To the best of my knowledge, there is not a "standard" split. The beekeeper must contact other beekeepers that are selling splits to determine how many frames, how many adult bees, and how many developing bees will be in the split. The buyer should also determine if frame replacements are required. It would probably be a good idea to check with the state inspector to be sure the individual has a good record of disease control. Occasionally special deals may be worked out with another beekeeper for the purchaser to provide the manual labor required to make the splits. I've heard of prices ranging from \$25.00 to \$50.00/split depending on the size of the split and the amount of labor required. It makes sense that on-site pickup of the splits will considerably reduce the cost of shipping (assuming there's no long drive involved).

Swarms

I seriously doubt that there's a beekeeper anywhere in the world who doesn't experience a rise in blood pressure at the mention of a six-pound swarm being available for the hiving. It's true. Swarms are an excellent way to restock Winter killed hives. The only problem is that they are so unpredictable and, due to mite predation, they have become somewhat uncommon. They are also inaccessible at times – requiring great feats of strength, bravery, and agility (maybe other descriptive terms would have been more appropriate here). The point is that they are sometimes simply not worth the risk. Another confession? Sometimes I hold some winterkill equipment for the swarms that comes my way. Of course, those swarms are never from my hives.

The "Dead-Outs"

"Dead-Outs" are simply colonies that died during the Winter – for whatever reason. There are few reasons to wish for colony winterkills, but if it happens, the beekeeper has a window to perform routine hive maintenance and late winter busy work.

Fix and Repair Old or Broken Frames

Increasingly, I am agreeing with those people, who years ago, were recommending the disposal of old, dark combs. Use common sense here.

If the frame is still perfectly useable, then use it, but if it needs extensive repair, is distorted, or has a lot of drone brood, toss it. (Actually, they make great kindling for a fire to keep you warm while working.) The reason for my change-of-heart is the possibility that pesticides are accumulating in old wax and the increased concerns about old combs harboring viral and bacterial pathogens. My general recommendation...use old comb, but don't become attached to it.

Scrape Propolis and Burr Comb

Bees busily apply propolis in the Spring; you busily remove it during the Winter. While the frames are out, scrape propolis and burr comb so the frame fits more cleanly in the hive body. I'm not sure why, but I always save the propolis scrapings. I've never sold any, but I confess that I do like the smell of fresh propolis.

Repair and Paint

There will never be a better time than Winter to scrap, repair, and paint the hive equipment. It's cathartic. From a dead hive, you remodel, restore, and reinstall a new colony. I feel frugal and a radio and a warm fire help with potential boredom during this Winter task. If you mark or brand your equipment, do it now, just before repainting.

Reoccupying Dead Hives

From the bleak disappointing death of a colony arises the birth of a new, refurbished colony in a clean hive. High Winter colony losses, however, are sometimes indicative of management procedures that need to be improved or other wintering issues that must be addressed. But you should be prepared for some colony deaths each year. In fact, all beekeepers can expect some winterkills during some years. Take it in stride and prepare the equipment for the re-establishment of a new colony the next Spring. Thoughts of Spring can make the coldest Winter day more tolerable. **BC**

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Collapse, Diagnosis & Recovery

My bees were dying. I'd done everything I was supposed to, I thought. What was going on?

Don Jackson

Hives collapse and die for many reasons, ranging from starvation, poison from agricultural chemicals, foulbrood diseases, mite infestations, nosema disease, predator damage, and viruses. Some of the problems are new, and our job is to figure out what they are and how to correct them. Let me explain.

Three years ago we had a good honey crop. As usual, my 240 hives looked great in late Summer, just what one can expect after a good year. But this is Minnesota – we know what real Winter is like here, so Fall preparations are inevitable. Supplemental feed, nosema disease prevention, and the usual control of the endemic *Varroa* mite are imperative.

I usually wait until about the first of October to begin these Fall tasks. In 2009 I visited each of the 14 yards of bees, gave the first dosage of thymol mite control, slapped a hive-top feeder on each of the two-story hives, filled it with two gallons of syrup, and stirred in the recommended dosage of Fumidil-B for nosema control. Foulbrood is not a problem as I burn infected combs if I find any, and I run strains of bees that are supposed to be resistant to tracheal mites.

That October turned very cold. Four days reached 50°, while the thymol needs a temperature of the 60s to the 80s to be effective in killing *Varroa*. We had wasted our money on that, but the bees did take the syrup down during the sunny days, so I thought there should be good *Nosema apis* control with the Fumidil-B added to the syrup. I didn't worry too much about *Varroa* because annual treatments were keeping it under control, but hated to lose the investment in miticide that was ineffective.

But still, some of the colonies were collapsing, even though they had made a great crop. I didn't know why, and had always tried to do what had to be done to preserve colony health, but the trends of modern farming worried me a great deal, with the practice of monoculture, the explosion of corporate farms, and heavy dependence on genetically-engineered seed, herbicides, chemical poisons, and fungicides. Our area has turned into a giant corn field of thousands and thousands of acres in recent years to feed big beef and dairy herds. I know that corn seed had been treated, especially with systemic neonicotinoids. Were the bees damaged from the toxic insect killers as they gathered pollen from the tassles and dew drops from the corn leaves in the mornings?

The hives are palletized, and were brought home and placed indoors for the Winter months. I know how

to Winter indoors, and have been doing it successfully since 1979. They sit in an insulated buildings, with a flight hole for each four colonies that can be opened up during warm Winter days for cleaning flights, continuous ventilation to pull warm air down from the ceiling and kick it out at floor level (which equalizes the temperature), and careful monitoring of carbon dioxide buildup in the air (to keep it down to less than 2% above normal). Moisture is added inside after February first so that the brood doesn't dehydrate and die.

By late December a few more colonies were dead. This was not normal, for seldom is a single hive lost at that time of the year. Occasionally one or more may not make it through January, but almost always that is my fault – they run out of food and starve. But in the Winter of 2009-2010 there was an excessive mortality rate. Obviously something was wrong. Dysentary was also showing up on the top bars, because the bees were defecating inside the hive.

What could this be? We had learned how to check for tracheal mites with a microscope, but couldn't find any. The bees could have gotten into agricultural chemicals which had been sprayed on crops and gathered poisoned pollen, but I had no way of checking for that; if I would ask my neighbors what they were using on their fields, I'm sure they would think I was accusing them of destroying my bees, not good for public relations. There was no known foulbrood as I had thrown any diseased combs into our outdoor furnace.

Varroa was always a potential problem. I initially found *Varroa* after a careless California breeder shipped queens that were supposed to have queen tabs but did not, and besides, now *Varroa* is everywhere. The dizzying list of viruses associated with the mites keeps growing – Deformed Wing Virus, I. Accute Paralysis Virus, Kashmir Bee Virus, and now, Invertebrate Iridescent Virus . . . it's hard to keep up with all the stuff infecting the bees. Some of the lines I have tried show considerable tolerance of *Varroa* and keep the populations low, but two of the resistant lines were the first to succumb to serious *Varroa* infections (interestingly, neither ever made a decent honey crop either). Obviously, the fecal matter and behavior of the bees did not look to me like a *Varroa* problem. Besides. I knew how to check the brood for *Varroa* infestations and had done many, many hundreds of ether roll tests. And I did not see deformed or misshapen bees so characteristic of virus damage.



Collapsing colony with too few bees left to care for the brood. The brood pattern is also not as solid as it should be: your sharp eye should tell you that the colony is in trouble, even if frames like this are covered with bees.

What Is Wrong With The Bees!

The colonies were moved back outdoors on March 10, 2010, as the weather was in the 40s during the daytime and I knew the insects needed a cleansing flight. The dysentery was terrible, the worst I'd seen since 1995-1996 when I was sold powdered sugar by a bee supplier and lost nearly everything (it was powdered sugar, cheap, and no one told me that it was unsuitable for bee feed). In March of 2010 only 111 hives had survived out of the original 240, and many were very weak. Even cleansing flights could not save them as the nights were still quite cold and the clusters inadequate to keep brood warm for the necessary 21 days. Now that the brooding-up was being attempted, observation revealed that much of it was not solid as it should be, some of the larvae were discolored, much of the brood was not hatching, and chilled peripheral areas were being abandoned by the shrinking clusters.

For our small bee enterprise, this was pretty serious stuff. We had gone from 240 hives in the Fall down to just 45. Normally we would have so many splits in the Spring that we could sell the surplus, but not this year: that doubled the financial damage. But new queens were ordered and 53 splits were made up from a few that were still strong, plus I purchased 30 three-frame nuclei from another beekeeper from California. This was a long way from replacing all of our losses, but it gave us something to potentially produce honey for the thriving local market. Would it be enough?

About this time we were hearing about the new strain of nosema – *Nosema ceranae*. Apparently some folks thought it was replacing *Nosema apis*, and was a problem not just in the wintertime, and in the north, but all over the nation at any time of the year. This strain of Nosema could break out and take a strong hive of bees down in as little time as two weeks.

I thought, "Why should I worry about that? I haven't purchased bees in a long time, except for a few in this Spring. Where could I have picked up a new strain of Nosema disease? . . . unless it was from a queen breeder that didn't know what was going on . . ."

Analysis

Sometimes in this life it is important to realize that the individual cannot solve all problems and needs to seek help, if it is available. In April of 2010 Gary Reuter

came to our local bee association to update us on what was going on in the latest research in the bee laboratory at the University of Minnesota under the direction of Dr. Marla Spivak. He was handed two bee samples from the club's demonstration yard (which was also giving us trouble) and three from my own apiaries, to test for Nosema. The club's bees showed no Nosema at all (which was probably a sampling error on our part as we made no effort to give him the older field bees which will be more likely to carry Nosema). My own samples were another matter, even though I also had not tried to concentrate on obtaining older bees:

Sample #3: 1,600,000 spores/bee (90 bees/90ml water). This sample was taken from a composite of my good colonies which had then been split. By June most of these colonies deteriorated badly, and the splits from them did not build up well, with poor ("snotty") brood patterns. Dysentery was bad, both inside and outside of the hives, but they had Fumidil-B in the previous Fall!

Sample #4: 730,000 spores/bee (103 bees/100ml water). This sample was a composite taken from collapsing hives, which also had fumagillin-medicated syrup the previous Fall.

Sample #5: 50,000 spores/bee (50 bees/50ml water). This was a sample of dead bees from a composite of dead colonies, also with fumagillin in the Fall.

To me these were unsettling results. For some reason the fumagillin had not kept the nosema under control. In spite of my bad sampling method, far too many spores had been found, both in the live and the dead bees. I had expected the medicated syrup to give us continuous control before, during, and after the Winter months. Was my treatment method inadequate? – perhaps. Were the bees already so stressed from chemicals, herbicides, and fungicides that they were taken down by smaller numbers of Nosema spores? – Nosema average spore counts greater than 1,000,000 are considered high, but I've seen bees thrive a lot better even with counts in the 5,000,000 range or more.

Try Something Else

It would be necessary to again attempt medication. At least, something wrong had now been found, and if the Nosema problem could be put to rest, then I could concentrate my efforts on other potential problems . . . or get out of the business.

What was being written about this new strain – *Nosema ceranae* – was not good. Does it not respond to Fumidil-b treatments? That stuff is high-priced, and it was necessary to always watch the bottom line. But there is another product, an oak bark extract that is supposed to promote intestinal health in the bees: Nozevit. I bought a big bottle of the Nozevit, mixed up a batch of sugar syrup, put both the Fumidil-B and the Nozevit into the syrup, placed my hive top feeders on the bees, and fed each colony.

The bees were sick but there was an abundance of Spring bloom (alder pollen, willows, and maples) available if they felt like working, and the syrup was left untouched. How to get the medication into those hives? I bought a couple of hand sprayers and decided to spray the concoction on the bees – they would then be forced to ingest it to clean themselves up and to clean the equipment where

the spray landed.

They like it! The minute the spray hit the bees, they began sucking it up. They cleaned themselves and the top bars really well. In about 10 days a second spray was given – same results. Would anything good come of it?

In about three weeks the brood patterns changed. Now they were solid, and the populations were exploding in many of the hives. Some of the hives had gotten so tiny that it took the rest of the Summer for them to build up to good size, and they missed the honey flow in July. But even in the Fall they had become populous, while many of the bigger hives had made 100-pound crops. I was stunned by the turnaround.

At the end of June four samples of bees were sent to the Bee Research Laboratory in Beltsville, MD to be tested for *Nosema ceranae*. While the lab didn't check for that specific strain of nosema, they did send the results back to me: "NO DISEASE OR PARASITIC MITES WERE DETECTED."

Follow-up phone communication with the lab indicated that "95% of the nosema cases are now *ceranae*." I had gotten lucky. While all that dysentery indicated possible *Nosema* problems, I had never seen colonies taken down so rapidly or so completely by such an infection. Besides, I had used Fumidil-B and in my own mind had done what should be done to prevent or to control *Nosema*.

When Fall came around, that sugar spray with both the Fumidil-B and the Nozevit drenched the bees, twice. Would they Winter? The bees were placed indoors again on November 4th. This would be a long Winter confinement, with no chance of a cleansing flight until removal in March. The Winter was cold and seemed endless.

The hives were removed on March 19. There was no dysentery, and that first spring flight left unusually little spotting on top of the remaining snowpack. Not only that, but the colonies were enormous, the biggest they had ever been for us in the Spring. I ordered queens and with splits increased the numbers by 118%, which built up well and gave us a decent income from the extra which were sold to other beekeepers.

In the Spring of 2011 the bees were again sprayed with the syrup medicated the same way. I mix the right amount of Fumidil-B and Nozevit recommended in the directions per gallon of syrup. Administered as a spray, it requires only a fraction of the costly stuff when used by the drench method. Another double treatment this Fall left the hives in what appears to be excellent condition



This colony died. The brood was not mature enough to hatch, and so there were no insects to replace the dwindling population. This brood pattern isn't good either.

for yet another Winter. And of course, during the entire last Summer the hives looked excellent, though the honey crop was small due to difficult weather (first too cold and wet, then too hot and wet), but they really packed the brood boxes full of food stores for the months ahead. Fall preparations were the cheapest they'd ever been for us.

What Was Learned

1. The bees were most likely taken down by what the lab found *nosema ceranae*. The medication method apparently worked.
2. I discussed this with one of Minnesota's migratory commercials this Fall. He said, "We're all spraying!" That was the first I'd heard about it!
3. Solving these difficulties is really up to the beekeeper, but we should not be shy about asking the bee labs to do some testing for us – our taxes and grants are paying for their services, and many of these people will bend over backwards to help if they can.
4. I raised queens from the better survivor stock, and it seems fitting that all of us should aim in that direction to improve the genetic pool.
5. This approach relieved my bee problem. But it does not mean that it will solve your difficulties, as a future article on the demonstration apiary of the North Central Beekeepers Association will show. I do think even our own apiaries are under added stress from agricultural practices as well as continued miticide uses, but this drench method gave our

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bees so much relief from the Nosema problem that they have been able to cope with the remaining environmental stresses up to now.

6. Much of America's commercial beekeeping is now migratory, and perhaps beekeepers have gotten away from Nosema treatments in the warmer climates. But I do not believe the problem has gone away, especially with the new Nosema strain, and perhaps more of the off-season mortality of bees is caused by nosema than beekeepers realize.
7. For successful beekeeping, relieve your bees of stress whenever possible.

Our bees took quite a beating, and it was difficult to realize the major cause. Here's hoping you don't have to go through it also, but for some of you, this situation should help you be able to figure out how to diagnose and copy with a similar situation. **BC**

Don Jackson is a commercial beekeeper in Pequot Lakes, Minnesota.

Credits

Shedding light on our bee problems is possible because of the research being done by scientists and technicians around the nation. But it is also important to get that information out so we all have access to it, and for that America's bee journals – *Bee Culture* and *American Bee Journal* should be appreciated. A very incomplete listing of a few of these interesting articles follows:

Aronstein, Katherine, *Detect Nosema Parasite in time to Save Bee Colonies*, *American Bee Journal*, January 2010, pp.63-65.

Gajar, Ivane Tlak, *Nozevit Aerosol Application for Nosema ceranae Disease Treatment*, *American Bee Journal*, November 2011, pp. 1087-1090.

Huang, Zachary, *Effects of Nosema On Honey Bee Behavior and Physiology*. *American Bee Journal*, September 2011, pp. 871-874.

Huang, Zachary, *Effects of Nosema On Honey Bee Behavior and Physiology. Nosema, No Matter Which, Is Bad For Bees*, *Bee Culture*, September 2011, pp. 21-24.

Oliver, Randy, *Sick Bees part 2 A Model of Colony Collapse*, *American Bee Journal*, September 2010, pp. 865-872.

Sanford, Malcolm T., *A Visit with Dr. Jerry Bromenshenk and Bee Alert Technology: Looking at CCD, Pesticides and Landmines*, *American Bee Journal*, December 2010, pp. 1161-1163.

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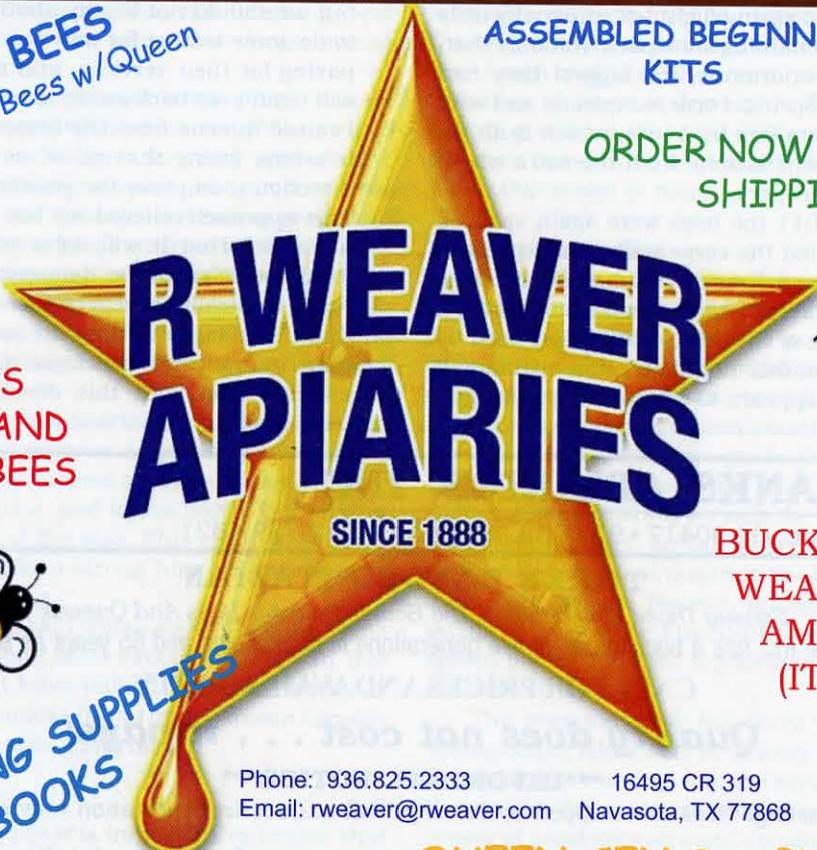
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Queen Conditions

*All Manner Of Things Can Happen To
Queens. Learn To Recognize The
Symptoms Of Each Situation.*

Ross Conrad

This month let's explore some of the various queen conditions that may exist in a hive, so that next month we can examine some of the options and suggestions on how to deal with these conditions.

With the arrival of Spring, known as "mud season" here in Vermont, comes the time for inspecting hives and evaluating their condition. A critical part of the colony evaluation process is judging the condition of the queen. The state of the queen has a major impact on both the short- and long-term health of the colony. For this installment let's look at European honey bee colonies that are queen-right; queenless; a drone layer; superceding; and swarming.

Direct observations of the queen herself can give us some information. Clearly if you see a queen, then there is a queen present. But what is her condition? Are the queen's wings frayed and tattered at the ends indicating that she is old and perhaps close to reaching the end of her lifespan? Is she the same queen that was installed in the hive during a past season? Unless you have a photographic memory (and only a hive or two to keep track of), the easiest way to be sure she is the same queen is to mark the back of her thorax with paint or a tag of some kind when she is first introduced to the hive.

Unfortunately, finding a single queen amongst tens of thousands of workers and drones can be a difficult task. Thus it is often much easier and quicker to evaluate the condition of the queen by observing what is going on in the brood nest.

The Ideal Colony Condition

Much more can be determined about the condition of the queen, and the state of the hive in general, by taking note of the condition of the brood nest. In the ideal hive with a fertile laying queen, the brood area will be filled with mostly worker brood. The worker brood will typically appear in large patches on the comb and all the young workers being raised on each comb will appear similar in age. This will normally be seen as either: a large patch of un-hatched eggs or eggs intermingled with recently hatched eggs; a wide section of comb filled with pearly white larva all of a similar size; large areas of sealed worker brood; or comb filled with sealed worker brood intermixed with empty cells and perhaps the oc-

casional worker in the process of chewing her way out of her birthing cell when the brood is in its final stage and in the process of hatching.

Traditionally, beekeepers and queen breeders have always prized queens that lay solid brood patterns with few, or preferably no empty cells within the patches of brood. However, in his book, *The Buzz About Bees: Biology of a Superorganism*, author Jürgen Tautz points out that empty cells scattered among the brood are critical for warming the brood nest most efficiently. This is because, when a heater bee sits on the surface of the brood comb and increases its body temperature to warm the brood beneath it, she can only cover and therefore transfer heat directly to about two brood cells. However, when the same heater bee is able to crawl into an empty cell surrounded by brood on all sides and heats up her body, all six cells of brood adjacent to the empty cell are warmed, as well as the two cells directly opposite the empty cell on the other side of the comb. We used to think that the bees sitting in the empty cells scattered throughout the brood area were just resting . . . now we know better.

When it comes to drone brood, its layout within a queen-right colony will be similar to the layout of worker brood. We should see patches of similarly aged brood all clumped together, only the areas of comb containing drone brood will be smaller and less numerous. There will also be a clear delineation between the patches of drone brood and the more common and usually larger patches of worker brood. The patches of drone brood and worker brood, though they may appear next to each other, will not be mingled together.

Honey bee eggs, when laid properly by a fertile queen, are laid one per cell and stand up on end in approximately the center of the back end of the cell. This is true for both the fertilized worker eggs and unfertilized drone eggs. Becoming clear on what the brood and brood nest of a healthy hive looks like, as described above, is critical if one is to be able to identify from an examination of the brood when problems exist with a queen.

The Drone Layer

The easiest and clearest indication that things are amiss is when the only brood present in a hive is drone brood. This situation signals to the beekeeper that the colony lacks a fertile laying queen. There may be a queen



Worker and drone brood intermixed is a sure sign of approaching queen failure.



Emergency superseded queen cells, found on the face of a frame indicated an abrupt loss of the previous queen, such that the only eggs, or larvae, available were in typical worker cells.

in the colony who is unfertile, or more often than not, the complete absence of worker brood is an indication of queenlessness. In the absence of brood and the pheromones that the brood releases that normally inhibit the development of the worker bee's ovaries, a number of workers will typically have their ovaries develop to the point where they will be able to lay eggs. Since the worker is incapable of mating, the eggs laid by such a worker will always be unfertilized and result in the production of drones. According to Tom Seeley's *Wisdom Of The Hive: The Social Physiology of Honey Bee Colonies*, laying workers exist in hives most of the time. It is just that in a queen-right colony the number of laying workers is extremely low and the nurse bees will cannibalize the unfertilized eggs the laying worker produces in order to recycle the protein they contain. This dynamic changes however, in hives where a fertile laying queen is absent.

The drone brood produced by a laying worker will not appear as neat and tidy as the drone brood produced by a fertile queen. Rather than have patches of comb that contain all, or mostly all developing drones of approximately the same age, there will be numerous empty cells mixed in among the cells in the comb containing drone brood when laid by a worker. This is due both to the fact that laying



Swarm cells are 'usually' found on the edge of the brood nest, and often on the bottom edge of the comb, hanging below the bottom bars.

workers do not lay their eggs in a tight pattern like fertile queens, and because many of the eggs laid fail to hatch. This produces brood with a spotty, shotgun-like pattern of drone brood that features eggs, larva, and sealed brood all mixed together in close proximity.

In addition, the eggs produced by laying workers will be flopped over on the sides of the cell wall, instead of standing up on end way in the back of the cell. This is because the abdomen of the worker bee is not as long as the queens, preventing the laying worker from reaching the back end of the cell with the tip of her abdomen when laying eggs. More often than not, laying workers place multiple eggs in each cell. If any queen cells are present they are likely to be small and not viable.

A laying worker hive will often be more aggressive or jumpy when being worked than its queen-right neighbors. Another clue that the colony is queenless is that, compared to a normal hive, it will tend to emit a louder, higher-pitched sound from the workers fanning their wings when the hive cover is removed. This sound is often referred to a loud "roar." The workers also have a tendency to run around more when the frames are being handled and therefore appear "nervous."

The Failing Queen

A sign that a queen is getting old and beginning to fail is a brood pattern in which both worker and drone brood are intermingled instead of neatly separated (see photo). This is a sign that the limited quantity of sperm that the queen was able to store in the organ called the spermatheca is running out. During this period the queen will often attempt to lay fertilized eggs, but fail to successfully fertilize them due to the shortage of sperm in her system. All other things being equal, it takes several years before a queen will reach this stage in her lifecycle if she was well mated, remains healthy, and the colony is not unduly stressed. However, this timetable is dependent upon the number of drones that the queen was able to mate with during her mating flights. If with few drones, the result of fewer drones being available, drones not producing sperm, poor flying weather or a damaged or ill queen. Queen cells indicating that the workers are trying to raise a replacement queen may, or may not be present.

The Queenless Hive

A colony may lose its queen as a result of numerous events including: pests or disease, failure to mate, beekeeper carelessness, failure to replace a lost queen, swarming, and old age. A hive that becomes queenless may exhibit a variety of symptoms within the brood nest depending upon how long the colony has been without a laying queen.

A hive that experiences the sudden loss of their queen may have brood that looks perfectly normal within the first three days. The third day following the loss of the queen, no un-hatched eggs will be found. As time progresses, the beginning of queen cells are likely to appear. As more time goes by all cells containing larva get capped, including any queen cells that were created. Since no eggs are being laid, an absence of uncapped cells containing larva eventually results. In its most advanced stage only adult bees are present and there is a complete absence of brood in the hive.

Do not be fooled by hives that contain no brood during

the months of November, December, and January. This is the time of year when queens usually slow down their egg laying and often stop laying altogether for a short period of time as the hive conserves food and energy during the dearth of Winter.

The absence of brood in a colony can also be created when there is not enough food (honey and/or pollen) available to accommodate brood rearing. Therefore, when observing a condition of broodlessness within a hive, the amount of honey and pollen stored within the hive should be considered, as well as the time of year.

Another opportunity for a false diagnosis of queenlessness can occur in hives that are undergoing queen replacement or supercedure. Queens are replaced within a colony when they either are removed from the hive (usually by a beekeeper or death) or when they become injured or begin to run out of stored sperm and are unable to perform their duties appropriately. During the process of replacing the queen, a hive will undergo a period where there is an absence of brood. This condition may be mistaken for a queenless condition unless one notices the clues that indicate a queen is in the works. These include the presence of supercedure queen cells or queen cell remains after the developing queen vacates the cell, or large patches of comb where no eggs are present but the cells of empty comb are all cleaned and polished and the bees are keeping these cells clear of honey and pollen in anticipation of the queen beginning her egg laying. These clues result from the fact that the queenless hive is a transitory condition that usually leads to either a hive that successfully raises a new fertile queen, or if unsuccessful, end up containing laying workers.

The Swarm

Another situation that impacts the state of the queen and the condition of the brood nest is swarming activity. When a colony decides to swarm the queen will lay an egg in one or more queen cups. As the new queens develop, the mother queen slows down her egg laying activity because she is being fed less, thus trimming down to prepare to fly to her new home. Eventually she will stop her egg laying altogether in preparation for leaving the colony. The queen and approximately half to two-thirds of the workers will leave with the queen shortly before the new queens hatch. The symptoms visible in the brood nest of such a hive will be similar to those of a hive that is replacing or superceding its queen as described above. The primary difference is that queen cells in a swarming hive (aka swarm cell) are most often found along the outer edges of the combs, or on the edges of damaged comb, whereas, emergency or supercedure queen cells will be located in the center of a patch of comb with worker-sized cells.

As you can see, there is the opportunity for a number of things to go astray with the queen in a hive. Fortunately, there are things we as stewards of the bees can do to help bring the colony back into harmony. Next month we will explore some of the management techniques beekeepers can use to work with the various queen conditions mentioned above. **BC**

If interested, check out Ross's two-day Organic Beekeeping Workshop for Beginners at the Metta Earth Institute in Lincoln, Vermont March 31 - April 1, 2012. See Calendar for details.

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BEEKEEPING INSTRUCTOR'S GUIDE

The Bees Make A Queen Third In A Series

Larry Connor

In this session (or series of sessions, as you are able) examine with your students the three methods honey bee colonies use to make a new queen bee. In your lecture/textbook section review the biology of this complex subject. Then, if possible, go to the apiary to examine queen cell formation in swarming colonies, colonies undergoing queen replacement without swarming, and cell production following an emergency when the queen is suddenly killed or removed.

Discuss the actual mechanism of queen cell formation, queen larva feeding, maturation, emergence, maturation and mating with drones.

A. Lecture-Textbook

Use lecture materials you prepare, adapt from existing sources, or develop from the textbook you are using. Present discussions on the three mechanisms of queen replacement in the colony, and review the differences in conditions and biology found in each one. Use your textbook for reading material assignments, especially in older students and adults.

Queen Metamorphosis

Each queen passes through four distinct stages in her development, as part of complete metamorphosis. These stages are the egg, larva, pupa and adult. The entire process takes 15 to 16 days in the brood area of a hive. The variation is due to genetic and environmental factors.

Egg – Only a queen bee can lay an egg that will become a worker or a queen. Worker bees cannot lay female eggs, only male eggs, and only when the queen and brood are missing from the hive. She positions her abdomen in the bottom of a cell and lays the egg so it stands upright, held in place by a tiny amount of adhesive. Just before the egg is deposited, sperm is released so the egg is fertilized. The egg stage lasts right about three days, but is somewhat variable due to internal colony temperature fluctuations.

Larva – As the end of the third day approaches the

egg shell softens and slowly flattens to the bottom of the cell. Under magnification the egg loses its smooth appearance and becomes segmented. In a few hours it forms a C shape, and will hold this shape for several days as the worker bees feed it and it grows rapidly. Eventually, in the fourth or fifth day, the larva stretches out to feed on the remaining royal jelly, spin a silk cocoon and pupates.

All fertilized eggs are female, and for the first 50 hours or so of larval development all larvae are fed royal jelly, a protein-, carbohydrate-, and nutrient-rich diet secreted from the worker bees head and abdomen. The nurse bees offer this fluid directly to the larval mouthparts, or deposit the royal jelly at the bottom of the cell. After 50 hours, the nurse bees feed worker larvae a diet of pollen and honey, but the queen bee larvae continue to be fed only royal jelly. The abundance of protein and sugar in royal jelly stimulates the queen larva to eat more and thus provides the queen larva with the nutritional needs to become a larger, fully functional reproductive bee with large ovaries and with the ability to produce large numbers of eggs. The diet also creates a bee that does little else – queen bees are unable to forage, care for brood, produce wax, guard the hive or other worker bee duties.

Queen Pupae – Worker bees provision the larvae



with an abundance of royal jelly at the base of the cell, and then seal the cell so the larvae is able to continue feeding on the accumulated food. The cell is made of beeswax and some chewings from old combs, so the color of the wax cell reflects the strength of the nectar flow, if any, when the queen cell is produced. The darker the cell color, the more wax the bees removed from the comb in the brood area; lighter colored cells indicate stronger nectar flow.

Just before pupation the queen larvae defecates, leaving her fecal material in the base of the cell.

Adult Queens – Between 15 and 16 days after the mother

queen laid the egg, the new queen emerges from the cell. A day or two before emergence worker bees may chew the beeswax cap off the tip of the cell to reveal the silk of the cocoon. Compared to the worker and drone, the queen's mandibles are more razor like, having a smooth cutting surface. This facilitates the queens cutting her way out of the cell. If she finds a rival sister queen that is still in the cell, she will quickly chew a hole in the side of her sister's cell and sting the occupant with her unbarbed stinger. She can destroy dozens of cells and sister bees in a short time period. This can be a serious problem for beekeepers who produce queen bees for other beekeepers.

Once the queen emerges from the cell she is licked and groomed by worker bees, provided food and has her waste products removed. In several days she will make orientation flights in front of the hive and then leave with bees from the hive or solo for one or more mating flights.

During one or more flights from the hive the queen will mate with 10 to 20 or more drone bees. Each drone mounts her from the back, his sexual apparatus enters the tip of the abdomen and the queen's medial oviduct, and sperm is deposited there. During this his body stiffens and is thrown back with a pop, and separates from the queen. The next drone removes the remaining endophallis of the previous drone with a hook on his leg, and then mounts the queen. The endophallis of the last drone remains in the queen when she returns to the hive. Beekeepers see this as the mating sign. Worker bees will massage the queen's body and remove the endophallis. The sperm will migrate to a storage container in the tip of the the queen's abdomen called a spermatheca. The sperm remain alive in this structure for the rest of the queen's life, or until the supply is depleted.

Three conditions when queens are produced

1. Emergency response – When a queen is accidentally killed in a hive the bees detect the lack of her chemical production, or pheromones, they are quickly stimulated to modify worker cells in the hive so they are larger containing eggs (if available) and very young larvae. The bees feed the larvae in the cells with royal jelly for their entire larval period. There are usually a large number of cells started by different groups of nurse bees, but this number is reduced so only a dozen or more cells reach maturity. If a colony is strong, the cells will be large and the queen well developed; if the colony is weak, the cells may be small and the queen substandard.

2. Supersedure response – Every queen has a limited life. Some beekeepers have documented marked queens in their hive for five or more years, but the average is only about two years, and when queens are mass produced, only about six months to a year. Bees apparently do a better job of queen rearing than humans have been able to duplicate. Like the Emergency queens, bees select larvae of the correct age (if available) to produce queen cells. Because the queen is most often failing, there is less brood in the hive and fewer eggs for the bees to select from. This positions the Supersedure cells on the face of the comb. Beekeepers must learn to



Supersedure cell at the edge of a failing queen's reduced brood pattern.



Supersedure cell close up. The white wax indicates a nectar flow is underway.

respect these cells, as they indicate the natural replacement of the failing queen. Sometimes the old queen and her new daughter are found laying side by side, but this is for a limited time period.

3. Swarm cells – Bees have evolved the swarming mechanism to produce new bee hives. Unlike social wasps, hornets and even bumble bees, honey bees do not start a new nest with a single queen. Instead, the colony splits into two parts, with 40-60 percent of the bees leaving for a new home in the swarm. Usually the old queen leaves with the swarm. She is put on a diet to shrink her size, and the bees chase her around the hive to exercise her muscles for flight.

The remaining colony will be headed by a daughter queen pro-



Swarm cell at the edge of the frame.

duced in swarm cells. These are often at the bottom of the comb or frame because the queen has put eggs all the way out to the edges. Along these edges the bees build special queen cell cups, which are like a small inverted bowl. These cell cups are found in bee colonies all the time, but when the conditions favoring swarming develop in the Spring with abundant food and a large population, the instinct to swarm is triggered. The bees add additional wax to the cups and convert them to queen cells. Then the queen bee deposits eggs into the cell cups and the bees feed these larvae to become large queen bees.

Use textbooks, lectures and live colonies to study all the ways bees make a queen.

B. Apiary

Apiary session – It will be hard to arrange all of these conditions in the apiary for student observation, and some of these queen cell sightings must be made while visiting the bees for other reasons.

Swarming – Colonies can be made strong by feeding, adding brood, and confining the area of the hive. These three conditions seem to factor in contributing to a colony's stimulus to produce swarm cells. These cells are produced from eggs laid into queen cups by the queen herself, and are the only eggs that are predestined to be queens.

Supersedure – Watch older queens with failing conditions for the development of queen cells. They are often produced at the edge of the brood area, which is less likely to be at the edge of the frames as in swarming. These cells are produced from worker eggs and larvae selected by the bees.

Emergency – Prior to the class visit remove the queen from a small colony or nucleus hive. Store the queen on top of another colony, perhaps in the hole of the inner cover. There she will be warm and fed. The queenless colony will produce queen cells and your students can document the development and fate of these cells. The use of digital camera will let students count the cells in the classroom. Gently brush the bees off the frames with a bee brush to see all the cells on the combs. A suggestion: have only one frame of eggs and larvae in the colony when you remove the queen. This will help the students find the queen cells without searching throughout the entire colony.

C. Laboratory

Suggested activities:

- Examine queen cells produced by the three instincts, and by a beekeeper using cell cups
- Examine the mouthparts of a queen bee under the microscope and compare the structure to the mouthparts of a worker bee
- Compare the sting of a queen with the sting of a worker bee. Why would a queen be disadvantaged by having a barbed sting?
- Look at a dissected queen with her abdomen filled with developing eggs. Compare this to the abdomen of a worker bee.

Conclusion

At the end of this session or series of sessions, each student should have a good introduction to the ways honey bees produce queen bees. Encourage students to learn more from reference books, online, and from other sources. **BC**

Vocabulary

Adult	Metamorphosis
Adult hatching	Pupa
Cell cup	Queen cell
Developmental time	Queen Replacement
Egg	Royal jelly
Egg laying	Sperm
Ejaculation	Spermatheca
Emergency Cell	Supersedure Cell
Endophallus	Swarm Cell
Larva	Swarming
Mating sign	Swarming instinct

Reference Books:

- Caron, Dewey, *Honey Bee Biology and Beekeeping*, Wicwas Press, Kalamazoo, MI, ISBN-13: 978-1878075093
- Connor, Lawrence John, *Bee Sex Essentials*, Wicwas Press, Kalamazoo, MI ISBN-10: 1878075225, ISBN-13: 978-1878075222
- Connor, Lawrence John, *Queen Rearing Essentials*, Wicwas Press, Kalamazoo, MI, ISBN-10: 9781878075239
- Laidlaw, Harry and Rob Page, *Queen Rearing and Bee Breeding*, Wicwas Press, Kalamazoo, MI
- Winston, Mark, *The Biology of the Honey Bee*, Harvard University Press, Cambridge, ISBN-13: 978-0674074095

Dr. Connor will conduct programs in Colorado in April. Advanced Beekeeping will be the subject of a day-long session in Denver on April 21. He will speak at the DenverBee group in Denver on April 24, and the Brighton Bee Club in Brighton, CO on April 25. For further information check with LJConnor@aol.com or www.wicwas.com

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About Beetle Traps

David Miller

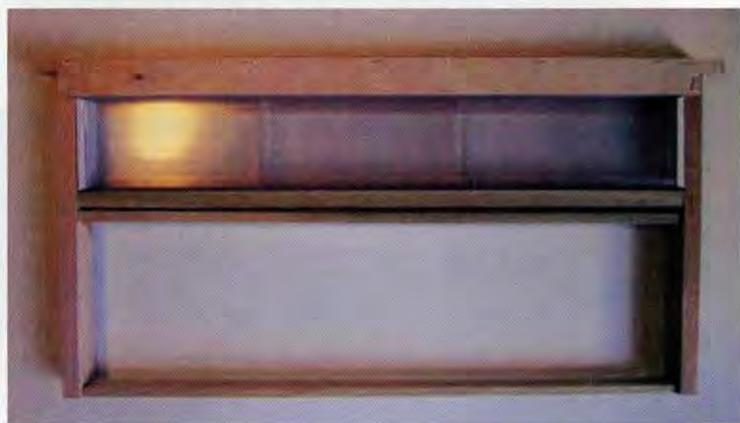
What traps do I need for Small Hive Beetles?

This is the most frequently asked question we get. I don't like replying to a question with a question. That depends on a lot of different factors. Most importantly, how many Beetles do you have? How strong are your hives? Where are your hives, (what part of the country)? Elevation, climate and soil type are all factors. What time of year is it?

If you are not seeing any beetles you may not need any traps. Ask other beekeepers in your area if they are seeing beetles and how much of a problem they have. If nobody is seeing beetles in your area, you don't have to worry too much. If other beekeepers in your area are seeing a lot of beetles or are losing hives to beetles, get ready. If you see some beetles, any number, one or 100, you should take some action, if nothing more than checking the hives every week. Probably a good time to order some traps and get ready. If your hives are strong and with lots of bees fully covering all frames you're probably ok, at least for the moment. Screened bottom boards with oil traps are highly recommended not just for beetles but also mites. If you choose to use oil traps or pans under the screen it is best to have the screened bottom traps, that have additional ventila-

tion on the sides or front and back. The ventilation is the real benefit to reduce moisture and to discourage beetles and mites. Remember Beetles can get in the hive anywhere there is a space or crack big enough, about

Frame trap.



1/32 of an inch is big enough for a beetle to get through. If you have number eight or larger screen on the bottom the beetles can and will enter through it, unless there is an oil pan that fits tight under it. Vents should be covered with small window type screen to keep beetles out. If you have inner covers with vent holes, this is a great place for beetles to enter. Beetles follow the scent of the hive to find their way in. The vent holes let the hive breath and when the scent escapes it attracts beetles. A small

piece of fiber glass window screen will lay flat over the vent hole, the bees will usually propolize the screen in place. You may be surprised how many beetles you see on this screen trying to get in the hive. The screen will also keep wax moths and roaches from entering.

The small plastic traps that fit between frames are a good to start with, after first sight of beetles or even before you see any beetles. There are several types of small plastic traps, so pick the type that best fits your style of beekeeping, disposable or reusable. It can't hurt anything to have a trap or two in each hive just for monitoring. I discourage using any type of chemical inside hives.

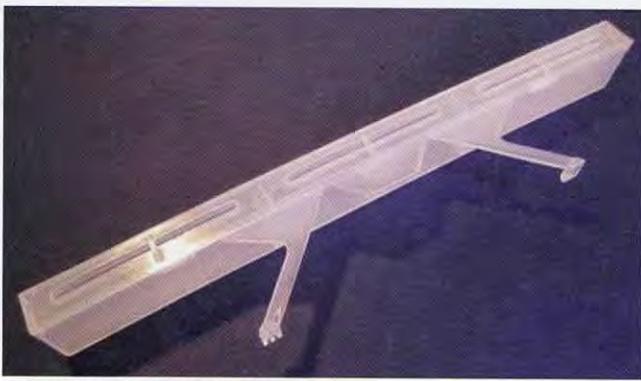
Ok, where in the hive should the trap go is the second most frequently asked question. That depends on the size of the hive. The beetle's goal is to get to the pollen and brood, to raise their brood of strong young beetles, just like your bees need protein from pollen to raise strong offspring. The bees will chase the beetles as far from the brood as they can. So if you have a small hive with just a couple supers and brood in both supers, all frames covered with bees, put the traps on the top super in opposite corners. Later in the year when you have a super or two of honey and add another super, or if the top super doesn't have a lot of bees in it put a trap or two down closer to the brood.

If you have a weak or declining hive with a small population you might want to remove a super to increase the bee density, in this case put the traps on the top super.

If you are seeing a lot of beetles, hundreds or more, piled on top of each other in the corners and between the frames on the frame rests, and every little hiding place



Entrance trap



Between frame Beetle Jail.

has beetles, you need to get serious. Several more small traps are required, or remove a frame and put in a full frame trap. If you have several hives chances are that one hive is getting more than its fair share of beetles. This is a good place to try an entrance trap. These will catch a large percentage of the critters as they try to enter the hive. Many times the strongest hive will attract the most beetles as it is putting out the most scent. Beetles may



enter and leave again as it is too strong for them to lay eggs in. An entrance trap will get most of the beetles as they enter and the beetle will never get the opportunity to leave to invade a weaker hive.

If you have a hive that has beetle larva in a frame or two, don't despair, there is still hope. Take the infested frames out and freeze or destroy them. If there is just a small area or corner of the frame with larva, after it has been frozen for 24 hours you can let it thaw and rinse it off with clean water, shake water out of the empty cells and

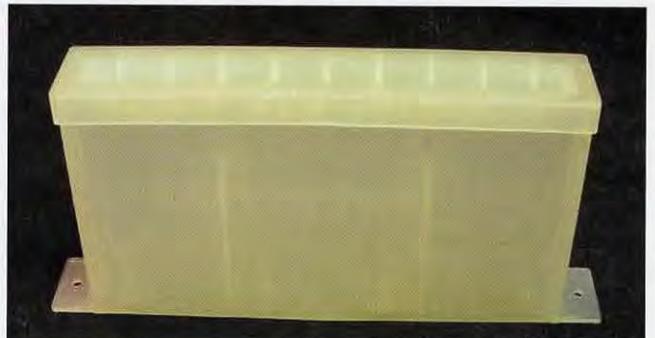
put it back in the hive. The bees should clean it up. This would be a good hive to remove a super from to increase bee density. If you have an entrance trap put it on the hive and shake the bees and beetles off each frame on the ground just feet away from the hive. Beetles returning to the hive will get trapped as they try to re-enter the hive.

Another neat trap you can make is an empty plastic water bottle cut it in half and turn the top upside down inside the bottom half. Tape them together, so the funnel end is pointing into the bottom. Then you can scrape or scoop the beetles into the bottle as they are crawling on the inner cover and on the outside of the hive. When there are lots of beetles this can be quicker than squashing them with a hive tool. When finished you can kill the beetles in the bottle by simply sticking a cork in the opening and leave it out in the sun. The beetles will cook in few minutes on a hot day.

Always be prepared to fight the beetles. If a feral hive near you gets destroyed by hive beetles. Thousands of hive beetles will be produced and they will all be looking for a new home. Your hives may could overwhelmed very quickly. **BC**



Beetle Blaster, top view and side view (above).



Hood Trap.



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Questions?

What equipment, when and from where?

How do you become a beekeeper? There are so many items to buy and procedures to learn that a person can get confused. I look at beekeeping catalogs, I listen to beekeepers, I go to beekeeper meetings, and I read beekeeping books. The result of these activities leaves me in a stupor.

I don't know if the thing that you keep bees in is called a gum, hive, stand, box, or a moth trap. How do I buy bees, anyway? Do I buy a package, a nucleus hive or an established hive? I understand that the normal package of bees comes with a queen. If I specify and pay more, I can get a special queen or have the queen marked. I can order a package without a queen and pay a slightly lower price. Is there an advantage to a queenless package? Packages are usually available in two, three, and four pound sizes. However some companies are now selling number two and three packages which are not measured in pounds. Which is best?

There are regular bottom boards, ventilated bottom boards, and reversible bottom boards. Some bottom boards are made of solid wood or plywood, and some are made of plastic. The different kinds of wood that are mentioned are Ponderosa Pine, Cypress, Oak, Cedar, Locust, Basswood, Poplar, and in some countries Teak.

There is 10-frame equipment, eight-frame equipment, and three, four, and five-frame nucs. The equipment is made of wood, plastic, and other compositions. There are Max hives, Garden hives, and Common Sense Hives with an upper entrance. I see in the bee books that they mention Jumbo hives, Long hives, Dadant

Improved hives, Two Queen System hives, Kenya hives, American hives, WBC hives, Ventilated hives, and others.

There are different heights of the boxes that are sometimes called boxes, supers, feed supers, brood supers, comb supers, half depth supers, shallow supers, medium supers, western supers, full depth supers, 6-5/8" supers, Illinois supers, Ross rounds supers, and Hogg half comb cassette supers. Some of the dimensions are the same in height, but the American made supers are narrower than Canadian supers.

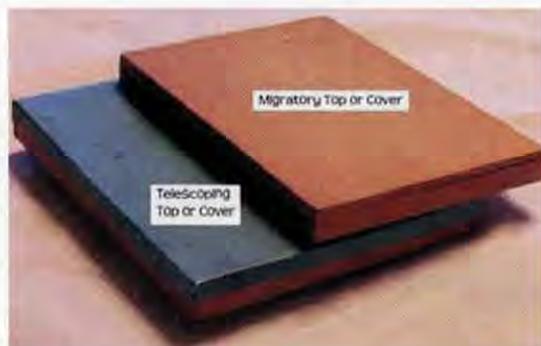
What are the things that go inside of the boxes? Do you call them sashes, frames, or dividers? There are



all wood ones, a combination of wood and plastic, solid plastic or two piece plastic ones. Some of these things have wedge tops, some are grooved, and some have an open slot. The tops of these things have different thicknesses. One is about $\frac{3}{8}$ of an inch thick while the other is about $\frac{3}{4}$ of an inch thick. The bottom pieces of these things can be two pieces, a solid piece, or a grooved stick. The terms self centering and self spacing are sometimes used when describing them. What is a Bee O Pac frame? Some of the old, old items had a convex "V" on the top board, while others had a metal strip that wrapped over the top and fastened on the sides of the end board. Some of the other old items had small staples that protruded from the end boards.

Should I purchase a hive stand? Some beekeepers tell me that I should use concrete blocks and others have plans for wood supports. I notice that the commercial beekeepers put their hives on pallets. There is also a four piece cypress frame with a slanted front piece that I can buy that is called a foundation or hive stand. What is the difference between this foundation and the foundation that is used in a frame?





I wonder about the frame foundation and am bewildered about what I should purchase. I see that there are different sizes and kinds available depending upon what size and type of frames that I have. I notice that again there are pure beeswax sheets, wired beeswax sheets, welded wire foundation, plastic sheets, and beeswax coated plastic sheets. What is the difference between triple-ply beeswax or regular beeswax sheets and thin surplus beeswax sheets? Some of the sheets are called medium and I thought that was a size of super. What is the proper cell size?

Do you call the outside upper part of a bee hive a top or a cover? They are also available in different kinds of materials and are in telescoping, migratory, and ventilated models.

There are many types of feeding devices available. There are entrance feeders, top feeders, and frame feeders. Which type is best? Some people advocate feeding bees sugar syrup while others mention fondant or high fructose corn syrup. When and how do I use a solid type feed versus a liquid syrup? Are there special formulations of feed for the time of the year? Do I put medications into the feed? I noticed that there are all kinds of other chemicals on the market, which ones do I use? Are these illegal or dangerous to use?

There are many types of excluders such as plastic, galvanized metal, and Chrysler metal with or without



a rim. Some beekeepers say that I should use an excluder while others are against the use of an excluder. If excluders are needed when do you use them and which ones are best?

Several beekeeping companies offer different sizes of smokers or fumigators for sale. Some of these smokers have different features and are made of different materials. There are some that have instant smoke or light automatically. What should I get or should I start smoking cigars like many of the old timers did?

There are hive tools of different designs and sizes that are available and what should I buy or is a screwdriver sufficient? There are entrance guards, entrance reducers of all kinds, queen and drone traps, divider boards, slatted racks, frame spacers that nail in or slip on, frame spacing tools, hive cover cloths, grafting tools, marking devices, down and out boards, fume boards, Bee Go, Honey Robber, Bee Dun, Bee Quick, Snellgrove boards, bee escapes, conical boards, double screens, entrance screens, moving screens, bee brushes and many other beekeeping items on the market. What items are necessary?

Do I need a bee suit, bee jacket, helmet, veil or gloves? What sizes and features do I look for? Is there a difference between ventilated and plain? Is goat skin better than vinyl or cotton? Is an indestructible veil really indestructible? Does a folding veil really fold? Can a bee sting through it or what makes it sting proof? Whatever happened to the helmet that had a solar fan on it? Has anyone seen a veil that had a Plexiglas front panel lately? Can you open the veil so you can sample the honey, take a puff on your cigarette or spit tobacco?

It looks like many of my questions would be answered if I would just purchase a beginner kit. However there are different sizes available and sometimes a company will include items that will need to be replaced shortly because it is smaller than needed or a cheap item that was included to keep the cost low. Therefore there are questions about which kit should be purchased and if some options can be revised.

When I look at honey spinners or extractors, there are all sizes depending upon the number of frames it holds, the position of the frames in the machine, and if it has electric

power. Should I buy one that is made of plastic or stainless steel? What is a wax spinner? Is it any different from a honey spinner and is it necessary? Settling tanks, bottling tanks, sumps, pumps, and filters come in all different sizes and styles. Oh, yes, is the terminology uncapping or decapping? Do I need to get an electric knife or will a serrated kitchen knife or cold honey knife work? When is an electric plane, Maxant chain uncapper, a vibrating knife, Dakota Guinness, or Cowen uncapper (decapper?) necessary?

A person once told me that the "Herkimer's" killed his bees. When I looked up the word, it wasn't in my dictionary. It was lucky that I had listened long enough to him to find out that "Herkimer's" are yellow jackets. What other kind of predators attack bees and how do I control them? How do I control bee diseases, mites, and beetles?

It would be a good idea for a person starting beekeeping to locate a local bee organization and start attending their meetings. A North American bee club contact may be found on the internet by looking at "Find A Beekeeper" on this magazine's web page (www.BeeCulture.com). At the local clubs there will be experienced beekeepers that can help guide you. However keep in mind that not all beekeepers have the same method to do things and thus you will be exposed to many ideas.

It would be wise to subscribe to a beekeeping publication. There are two American beekeeping magazines. Both have paper and digital editions. Write or go on line for a free sample copy.

1. American Bee Journal, 51 S. 2nd Street, Hamilton, IL 62341, 217-847-3324, info@americanbeejournal.com.
2. Bee Culture, 623 W. Liberty Street, 1-800-289-7668, Medina, OH 44256, info@BeeCulture.com.

And, if you're reading this, you already know that the major suppliers all advertise their products. Get their catalogs – all of them – so you can begin your beekeeping adventure – and finally get some answers. **BC**

Jim Thompson is a retired Bee Inspector and he is currently a Honey Judge, living in Smithville, OH.

City Bees Need Manners

Think back – do you remember your Mother saying “Mind Your Manners!” And somehow you knew if you did *that* again you were in big trouble. Manners are important. Your guests do not want your dog jumping on them with big muddy paws. I expect my horse to stand still while I put his saddle on. Cats, however, have their own book of manners.

With the huge worldwide interest in urban bees, suburban bees and rooftop bees we need to consider our bees’ manners. Well, actually it has to do with how bees need to behave while living in those places.

City ordinances have been changing to permit bees. Local and state associations have successfully petitioned for regulations to be updated to make sure that beekeepers are allowed to keep bees. Actually I am sure bees were kept (illegally) well-hidden or camouflaged, in forbidden areas. Many years ago I knew a beekeeper with three hives in a tiny walled garden of a Federal era house on Capitol Hill in Washington, DC. His crop of basswood honey from the large old trees on Capitol Hill was delicious. The hives were invisible from any direction. The bees were quiet, calm Caucasians. Today bees are permitted to live in Washington, DC.

Strange – although bees were not allowed to be kept in some urban places, they did exist. Certainly, before *Varroa* arrived, bees were living in hollow trees in urban areas. Historically – let us go back to George Washington’s day – almost every house, whether in a city or in a rural area, had a beehive or two to supply both honey and beeswax. Colonies of bees were simply a part of everyday living no matter where you lived.

In those days bees didn’t need manners. Their behavior was simply understood by all. Until the advent of the Langstroth hive, swarming was an essential part of beekeeping. As the 20th century progressed it became known that a colony that swarmed produced less honey than one with a large field force. The swarming instinct was then deemed not a desirable trait and so breeders lessened the bees’ desire for swarming. But bees still do swarm.

For the urban, suburban and rooftop beekeeper swarming is bad manners. Why? If you are a beekeeper on a local swarm-call list you have met the hysteria that a swarm of bees can create. So here you are keeping bees on a rooftop. You are not present on the rooftop during the day on most days. Thus you may never see a swarm emerging from one of your hives.

Where will that swarm land? How about on a stop sign, traffic light, a parked car, a sidewalk tree, a decorative potted plant. All these are close to people walking or sitting in a sidewalk café. The bees may be planning to move on but in the meantime they are attracting the attention of passersby. True, some will be so engrossed in their iPods and cell phones that they notice nothing.

But what about the few who decide it is the moment for a hysterical response complete with screams. One of your swarms could land on a non-beekeeper’s rooftop garden. That garden may have some decorative item that your bees fancy as their new home. Not every rooftop gardener will be pleased.

All you need is one to complain bitterly to city hall about the “threat” to adults, children and dogs being walked. Will that person be the one that presses for a ban on bees in the city? Will

someone notify the local newspaper or TV station about the event? Try to imagine the commotion that could ensue from a swarm flying along a city street and landing on some convenient object. Could that swarm be traced back to its owner? That would depend on many factors.

Yes, those bees had bad manners. But you, the beekeeper, are the one to correct the bad manners (just as your Mother corrected you). Do you belong to a local beekeeping association? Do you have beekeeping books? Are you subscribing to the two bee journals? I hope so because there you will find much information about the nature of swarming and how to reduce swarming. Will trying to eliminate swarming from your colonies require more work and attention? Perhaps, but not necessarily. Just think – you may benefit from a larger honey harvest.

Both urban and suburban beekeepers share the same situations with each other and also share the swarming problem with the rooftop beekeepers. However here in



the urban and suburban areas beekeepers have green lawns, trees, private swimming pools, decorative ponds, flower and vegetable beds. Yes, there can be public places such as parks and community swimming pools, and also shopping centers both large and small. So swarming manners do count here.

Even though your next door neighbors know you are keeping bees and approve of your efforts "to save the bees" and enjoy your gifts of honey, swarms are just apt to skip those nice neighbors and settle a few gardens away. Perhaps they land in a new resident's tree. You can have the hysteria situation without knowing about it. You can't keep your bees secret forever in urban and suburban situations. Neighbors chat with each other. Kids are happy to say anything especially if they know you are the source of the delicious honey on the breakfast table. So you need to apply the same swarm "manners" information as the rooftop people. (See the recommendations for them above.)

Swimming pools, both private and public, will be found in urban and suburban areas. Children can be asked to leave the pool if they persist in rowdy behavior annoying other swimmers. Even one of your bees sipping water from poolside will be guilty of rowdy behavior. However instead of being asked to leave, frequently the bee gets smashed. Stinging insect hysteria can easily be found around swimming pools unless the bees have learned good water-source manners. In addition to swimming pools bees visiting a birdbath can be unnerving for non-beekeepers. Frequent rains can mean little pools of water in deck chairs, potted plants and other garden decorations.

Just as Mothers trained their children to have good swimming pool manners, you need to train your bees. The secret is supplying a water source before the bees discover the swimming pools. When do you think your bees will start flying for pollen and nectar? You are probably too late with that thought. In cold weather your water source may freeze. Well, break the ice and replenish. Bees need water for diluting honey, as well as cooling the hive. In some parts of the U.S. water will need to be available all year. In other parts with bitter cold and snow covering the ground you will need to watch for a warm trend. Those first bees out of the hive need to recognize their water source in order to leave swimming pools alone.

Backyard picnics and barbecues are warm weather pleasures found in urban and suburban places. As long as there is a good nectar flow bees are not interested in BBQ ribs, hot dogs, soft drinks and beer. Are you paying attention to the weather or are you just glad that it has not rained on your picnics for the last month? Drought conditions affect bee forage. Nectar can be in short supply. Although in late summer and early autumn yellowjacket visitors to picnics give honey bees bad press, bees will take advantage of picnic food. Sweet drinks, sweet cut-open fruit and anything made with honey will attract honey bees. Picnic hosts may hand out fly swatters along with knives, forks and spoons.

So the problem seems to be how to teach table manners to honey bees. They won't understand the lessons your Mother taught you (don't talk with your mouth full). Your best tactic is to keep the bees confined during the daytime hours of your and your neighbors' picnics.

Care must be taken in hot weather that the colony does not overheat, especially with a large population of bees inside. If you have only a few hives, a lawn sprinkler can be turned on to sprinkle the hive entrance. The bees just think it is raining and stay at home.

Urban and suburban beekeepers can have hives that are scattered so that the sprinkler won't work. Use a screen inner cover and remove the telescoping cover. The bees cannot exit but upward ventilation will reduce or stop any heat buildup. Then either use a closed robbing or moving screen at the entrance or close the entrance with window screen to allow air to flow. Of course a screened bottom board helps, too. When it is night the entrance screen can be removed. Just don't forget to do that or you will have very unhappy bees in the morning.

As far as the bees are concerned they are toilet-trained. Don't do it inside the hive - fly outside. In the warmer areas of the U.S. bees may fly year around so there is no problem with neighbors. However in the colder areas bees are confined until a warm day comes. The bees welcome the cleansing flight but you and your neighbors do not. These flights are a problem and a difficult one to solve. Perhaps a barrier such as a fence or hedge can force the bees to fly up high as they leave the hive. Perhaps you can face the hive entrance away from houses and cars. If you have a good solution for this problem, let beekeepers know about it.

Everyone gets grumpy from time to time. Bees can get grumpy, too. But usually it's not about income taxes or flat tires. With bees, it can be genetics or it can be from an overly enthusiastic or clumsy beekeeper. It may be wise to consider your beekeeping techniques to be certain you are not causing your bees to be disagreeable. Rural beekeepers can have crabby bees from skunk visits but these are not so common in urban or suburban areas. However it is up to you, the beekeeper, to recognize signs of skunk harassment just in case that problem does exist in your location. If it is a pesky skunk see the previous recommendations about swarm prevention to help you solve a skunk problem.

Bees do have to be fed sugar syrup from time to time. In an urban or suburban area an open tub of syrup set down in your yard may result in a bee frenzy reminiscent of kids' birthday parties. Only instead of fun the bees may become quite nasty. It's another case of bad table manners. Bees will behave much better if fed separately inside their own hives.

Beekeepers really do not know the inherent disposition of the drones that mated with the queen. A quiet colony can become quite nasty. Bad manners. (Your Mother would have sent you to your room to think things over.) No matter what the calendar says, requeen immediately but don't choose a weekend day when your neighbor is having an afternoon birthday picnic for 20 people. That would be the beekeeper's bad manners.

Good Neighbor policies do exist for beekeepers. I think a copy of those would be helpful for your bees. However, since they do not have the time to read, you will have to do that for them. Well-mannered bees are a delight not only to keep but also are good citizens of their community. **BC**

Ann Harman's well mannered bees reside near her home in Flint Hill, Virginia.

The Mints

Connie Krochmal

Add A Little Spice To Your Honey Bee's Life

Around 20 species of mints are found worldwide. There are also many natural and artificial hybrids. They're easily recognized by their square stems and opposite foliage.

The most commonly cultivated mints are spearmint, peppermint, and Japanese mint. All of the mints are excellent sources of nectar. These bloom mostly in late summer when typically there is a dearth of nectar. Because the variegated and fancy leaved mints aren't as floriferous, they are less suitable for bees.

History of Mints

A symbol of virtue, mints have been used since at least 8000 B.C. Since ancient times these have served many culinary purposes.

There are several versions of a Greek myth concerning mint. In one account, Pluto, god of the underworld, fell in love with Minthe, a nymph. After Persephone, his queen, became jealous, he changed Minthe into a mint plant. Another version has Persephone in a jealous rage trampling Minthe and changing her into a mint plant. In any case, the word mint comes from the Greek for sweet scented. These were grown in Egypt by around 1000 B.C.

A Roman myth explains mint's ties to hospitality. An old couple, Philomen and Baucis, took two strangers in and fed them after everyone else in the village turned the visitors away. At the time mint was used to clean dining tables to give them a pleasant scent. The strangers were

Zeus and Hermes in disguise.

The Greeks used mint in their baths, a habit later adopted by the Romans. The Greeks had numerous other uses for the plants, such as for temple rites.

Pliny the Elder wrote about mint and its culinary uses in the first century A.D. The Romans wore wreaths of mint to prevent or treat hangovers. They introduced mint sauce and spearmint to Britain.

Mint was one of the tithe herbs mentioned in the gospels of Luke and Matthew. This was also among the herbs in Charlemagne's list of recommended garden plants. The list was circulated throughout his kingdom.

Historically mint was used as a strewing herb and in perfumes as well as an insect repellent. This was grown in English monastic gardens for centuries. Mints were widely mentioned in Shakespeare's writings as well as those of Chaucer.

In the 1700s mint became a popular medicinal herb. The European colonists brought spearmint and peppermint to the New World.

Commercial Mint Growing In America

Spearmint and peppermint are grown commercially for oil. This is mowed, dried, and cooked to extract the oil. Peppermint yields 95 pounds of oil per acre while spearmint brings 103 pounds.

Peppermint is the major mint oil produced in the U.S. The first commercial mint farm in America was

near Cheshire, Massachusetts in the 1790s. Mint cultivation spread to New Jersey, New York, Michigan, the Midwest, and farther westward. Presently Washington and Oregon are leaders in production followed by Idaho, Montana, and the Midwest. Indiana is the third largest state in terms of acreage. Forty-five per cent of the mint oil is used for gum with a matching amount going into oral care products.

Growing Mints

Mostly hardy to zone five or so, the hardiness varies slightly from one species to another. These prefer a moist, rich, well drained soil with a pH of six to seven. Partial shade to full sun is suitable.

Mints have tough, aggressive, creeping roots that spread easily. Install root barriers at the time the mints are planted to control their spread. Space the plants about 1½ feet apart. There is no need to add organic matter to the soil before planting.

Several diseases are known to attack mints. One of the most common is mint rust. Rotation of the mint bed is recommended whenever the mint is replanted to prevent the disease from building up in the soil.

Various pests can harm mints. These include root borers, flea beetles, caterpillars, and spider mites.

Apple mint (*Mentha suaveolens*)

Also called woolly mint and Egyptian mint, this is native to Europe and Britain. It naturalized in the East. Spreading indefinitely, this very hardy perennial is two to three feet tall. It is covered with soft, gray, woolly hairs. The bright green toothed wrinkled leaves are round to oval, two to four inches long. The variegated form, pineapple mint, is unsuitable for bees.

The blossoms open white, changing to pink or mauve. These appear in the Summer and form slender spikes, four inches long, from the upper axils and terminally. Easy to grow, this has an apple-like fragrance and a



Corn Mint.

fruity taste.

Corsican mint or Spanish mint
(*Mentha requienii*)

A semi-evergreen, this plant will need mulching in zone four as it isn't as hardy as some mints. Often used as a ground cover, Corsican mint needs a moist shady spot with damp, rich, well drained soil. Low growing, this has thin stems that are usually four inches or so in height. It is taller when in bloom. The shiny stems are prostrate and thin. This forms a dense tight mat.

The very small, bright green round to oval foliage is a little over ¼ inch long. It smells like peppermint. The petite blue, purple, or lavender blossoms open all Summer. Because this species contains a toxic oil, it shouldn't be taken internally.

European pennyroyal (*Mentha pulegium*)

This shouldn't be confused with American pennyroyal, which isn't a mint. The Romans believed this could repel fleas. Historically it was used to purify the casks for storing the drinking water used on ships. It could have been one of the herbs used by the ancient Greeks for their Eleusinian rites. Known in the Middle Ages as royal thyme, this was recommended in the herbals of Culpeper and Gerard. This was also touted by John Parkinson in his book entitled *A Garden of Pleasant Flowers*, published in 1629. He recommended it for the kitchen garden for culinary and medicinal purposes. It was among the first herbs that were brought to America by the European colonists. Native to Europe and Asia, it has naturalized in some areas of the country.

Hardy to zone five, this is evergreen to semi-evergreen. Suitable as a ground cover, this low growing, creeping plant forms mats. It has branching, spreading prostrate stems. About six inches in height, European pennyroyal is a foot wide.

The oval to round foliage is small, toothed, and shiny, about ¾ to 1½ inches long with long petioles. European pennyroyal smells like peppermint.

Only ¼ inch long, the mauve, blue, or lilac flowers open in Spring and Summer in compact whorls or dense clusters from the leaf axils. The spikes are up to a foot long.

Spearmint.



This species prefers a slightly rich, moist, organic, sandy soil with a neutral pH. It is suited to partial shade and full sun. Since this plant is considered toxic, it shouldn't be consumed.

An excellent nectar plant, this can produce a lot of pale colored, somewhat thin bodied honey.

Field or corn mint (*Mentha arvensis*)

Native to Europe and Asia, this naturalized in many areas of the country after being introduced to the U.S. This perennial tolerates dry soil. It produces suckers that root. This erect hairy plant is two feet tall. It has lance-like to oval hairy toothed foliage, two inches long. On long petioles, the curly leaves are pale green. Often found along waterways, field mint has blue blossoms that open in axillary whorls.

A source of menthol, the Japanese mint is a variety of field mint. Its large green foliage has a very strong peppermint-like scent. This plant looks similar to the species, but is taller and erect with larger foliage. The pale lavender blossoms open in the Fall. Because Japanese mint contains a toxic oil, it is unsafe to take internally.

Field mint is an excellent honey plant.

Horse mint (*Mentha longifolia*)

This has been grown in the Middle East for centuries. After being introduced from Europe to America, this naturalized in the North, Midwest, and Mid-Atlantic. It is found in damp places, along roadsides, and thickets.

Hardy to zone five, this downy, highly fragrant plant is three to 4½ feet tall. It has soft, greenish-gray, ob-

long to tapered, toothed leaves, up to 3½ inches long. The mauve-purple to pink blossoms open July to September on long tapering spikes.

Peppermint (*Mentha piperita*)

A naturally occurring sterile hybrid of spearmint and water mint, this produces no seeds. Relatively new, it was first mentioned in 1696 in England. By 1721, it was listed in the *London Pharmacopeia*.

Introduced to the U.S. from Europe, this has naturalized throughout the country in wet meadows, along brooks, and streams. Three-fourths of the world's peppermint is raised in the U.S.

This two to three foot tall perennial is hardy to zone three. One to two feet wide, it is erect and branched with creeping roots.

There are two varieties of peppermint. Black peppermint has purple stems and dark leaves. White peppermint has very slender green stems.

Peppermint is very vigorous and fast growing. On long petioles, the toothed rounded to oval leaves, 2½ inches long, are pointed. This is less hairy than spearmint. The oil is produced by glands on the underside of the leaves.

The blossoms are white, pink, lilac, reddish, or lavender-pink. These open in mid to late Summer in rounded heads or thick spikes from the leaf axils and terminally. The flower spikes are broader than those of spearmint.

Also called Bergamot mint, the eau de cologne mint is a variety of peppermint. Three feet tall, this branching perennial has prostrate purple stems. Deep green tinged with purple, the oval to egg-shaped, toothed leaves are two to three inches long.



Water Mint.

Peppermint is an excellent honey plant. The amber to dark amber honey has a strong mint-like flavor initially, which mellows during storage.

Spearmint (*Mentha spicata*)

Native to Europe and Asia, this has naturalized over much of the country. One of the oldest mints, this is mentioned in the gospels of Luke and Matthew as one of the tithe herbs of the Jews.

The Romans had both wild and cultivated forms of this plant. In ancient times it was used to prevent milk from curdling. Dioscorides recommended this for various medicinal purposes as did Gerard, Culpeper, and Evelyn. Lauded by John Parkinson in his book published in 1629, he recommended it for the kitchen garden for both medicinal and culinary purposes. According to Josselyn, spearmint was widely grown in New England during colonial times. It became known as spearmint in the 16th century due to the spear-headed blossoms.

This hardy perennial is the most widely grown mint. Hardy to zone four, it is usually two feet in height – shorter than peppermint – and over a foot across. This has erect, smooth, upright, vigorous stems, often red tinged. Spearmint is milder flavored than peppermint. The vivid green, slightly wrinkled foliage is toothed, lance-like to oval and two inches long. A variety with curled foliage is called *Crispata* or *Curly*.

The small, wispy blossoms are pink-lilac, light pink, white, or pale violet.

These open from June through September in clusters on long, narrow, terminal spikes and in the leaf axils. This species grows well in damp places.

Spearmint is an excellent honey plant. The honey is amber colored and somewhat strong.

Water mint (*Mentha aquatica*)

Introduced from Britain and

Europe, this has naturalized in the North and Mid-Atlantic. Found in wet places and along waterways, this was one of the three sacred herbs of the Druids.

Hardy to zone five, this needs a moist soil. This much branched perennial often looks reddish. It is two feet tall and very wide spreading. The weak, thin stems tend to lean. Two inches long, the heart shaped to oval curly leaves are downy. This plant has a very pronounced fragrance. It produces lilac to blue-purple blooms, up to an inch across. Blooming all Summer, these open in whorls in terminal heads or spikes.

Water mint yields lots of nectar. The amber colored honey has a mint-like taste when first extracted, but this disappears with time. **BC**

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GLEANNINGS

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IS BT HARMING BEES?

A little genetic tweak is giving crop-protecting proteins called Bt toxins a new edge in overcoming resistance by crop pests and muting criticism of this side-effect of the GM technology.

The slight change in molecular structure was introduced by a University of Arizona research team that reported their success in the journal *Nature Biotechnology*.

It's an important development because one the most successful strategies in pest control is to endow crop plants with genes from the bacterium *Bacillus thuringiensis*, or Bt, which code for proteins that kill pests attempting to eat them.

This strategy was under threat because insect pests are evolving resistance to Bt toxins.

Project leader Bruce Tabashnik says a small modification of the toxins' structure overcomes the defenses of some major pests that are resistant to the natural, unmodified Bt toxins.

"A given Bt toxin only kills certain insects that have the right receptors in their gut," entomologist Tabashnik says.

"This is one reason why Bt toxins are an environmentally friendly way

to control pests," he says. "They don't kill indiscriminately. Bt cotton, for example, will not kill bees, lady bugs, and other beneficial insects."

Unlike conventional broad-spectrum insecticides, Bt toxins kill only a narrow range of species because their potency is determined by a highly specific binding interaction with receptors on the surface of the insects' gut cells, similar to a key that only fits a certain lock.

"If you change the lock, it won't work," Tabashnik says. "Insects adapt through evolutionary change. Naturally occurring mutations are out there in the insect populations, and those individuals that carry genes that make them resistant to the Bt toxins have a selective advantage."

The more a toxin is used, the more likely it is pests will adapt.

Previous work had shown that binding of Bt toxins to a cadherin protein in the insect gut is a key step in the process that ultimately kills the insect.

Results at UNAM indicated that binding of Bt toxins to cadherin pro-

Continued on Page 75

POLITICS COMES TO THE BEEHIVE

Kentucky beekeepers are shocked by the political firing of veteran state apiarist Phil Craft, who had held the job for 12 years under both Democratic and Republican commissioners.

WFPL radio quotes new Agriculture Commissioner James Comer, a Republican, as saying he is not eliminating Kentucky's beekeeping program, even though Craft was given his walking papers from the politically appointed position.

Comer laid off 16 of the department's political appointees, including Craft.

Comer's office tells the radio station the new agricultural tsar says he wants to appoint his own people

to these positions.

WFPL says the dismissal of an experienced, nationally recognized and admired apiarist is raising eyebrows in the agricultural community and has people asking why the state beekeeper is a politically appointed position.

Apiculture researcher Tom Webster says Craft was great at his job.

"I was involved in the interviews for that position and I recommended that Phil get the job because he had the attitude and the energy and the background and everything, so I was very happy that he did step in," Webster tells WFPL.

Alan Harman

RIGHT TO FARM IN FLORIDA

Local governments in Florida will no longer have the right to restrict beekeeping under legislation making its way through the state Senate.

Changes to the FL Right to Farm Act move the authority to regulate honey bee colonies to the state.

The Senate Agriculture Committee approved the proposal with a unanimous 7-0 vote.

Among the changes, the amendments revise the definition of "farm operation" to include honey bee activities as well as the placement and operation of an apiary. It expands the definition of "farm product" to include insects useful to humans.

It revises the definition of "apiary" to allow honey bee hives to be placed on agricultural land or land integral to a beekeeping operation.

The Dept of Agriculture and Consumer Services (DACS) is given exclusive authority to regulate, inspect, permit, and determine placement of managed honey bee colonies.

Bill sponsor Sen. Alan Hays (R-Umatilla) says local laws tend to be a knee-jerk reaction of a neighbor's complaint.

Florida's honey industry ranks among the top five in the nation with an annual worth of \$13 million. Some 17 million pounds of honey are produced in Florida each year.

Additionally, honey bee op-

erations benefit the state's fruit and vegetable industry by providing an estimated \$20 million in increased production numbers created by managed pollination services for more than 100 varieties of popular fruits and vegetables.

Beekeepers are required to register their hives and submit to an annual inspection. Based on inspection programs and inspection results, DACS also has authority to regulate the certification and labeling of Florida-produced honey and the issuance of certificates of registration and inspection.

The Florida Right to Farm Act makes legislative findings that agricultural production is a major contributor to the economy of the state and that agricultural activities conducted on farm land in urbanizing areas are potentially subject to lawsuits based on the theory of nuisance and that these suits encourage and even force the premature removal of farm land from agricultural use.

The act also prohibits local government from adopting any ordinance, regulation, rule, or policy to prohibit, restrict, regulate, or otherwise limit an activity of a bona fide farm operation on land classified as agricultural where such activity is regulated through implemented best

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MONSANTO, BASF GM RESEARCH MOVES TO US

Monsanto ends plans to sell its insect-resistant maize in France, a week after BASF says it is moving its GM plant science research from Europe to the United States.

"Monsanto considers that favorable conditions for the sale of the MON810 in France in 2012 and beyond are not in place," the company says in a statement.

Five other countries in Europe – Austria, Germany, Greece, Hungary and Luxemburg – have banned MON810.

In a sign that GM technology is a bridge too far in Europe, BASF says it is concentrating its plant biotechnology activities on the main markets in North and South America.

The headquarters of BASF Plant Science will be moved from Limburgerhof, Germany, to Raleigh, NC. Research and development activities will be concentrated mainly in Raleigh, Ghent, Belgium and Berlin, Germany.

"However, there is still a lack of acceptance for this technology in many parts of Europe – from the majority of consumers, farmers and politicians. Therefore, it does not make business sense to continue investing in products exclusively for cultivation in this market."

Some 157 employees work for BASF Plant Science in Limburgerhof. The company plans to close its sites in Gatersleben, Germany, and in Svalöv, Sweden. Some 57 people work in Gatersleben and six in Sweden. It is planned to transfer 123 positions from Limburgerhof and Gatersleben to other BASF Plant Science sites, mainly Raleigh, and to reduce 78 positions over the next two years.

Overall, this means that BASF is cutting 140 jobs in Europe.

– Alan Harman

FLORIDA Cont. From Pg. 73

management practices or interim measures developed by the Dept of Environmental Protection, DACS, or water management districts.

Some local governments greatly restrict or ban honey bee colony placement within their jurisdictions with the consequence of reducing pollination of plants and creating a more favorable environment for unwanted, more aggressive African honey bees to colonize.

Additionally, honey bees, honey bee products, and aquaculture products are being produced in farming operations but may not be included in the current law as farm products.

The changes will take effect July 1, 2012. – Alan Harman

BIG BUCKS AT THE BOTTOM OF THE GARDEN

The huge trend to vegetable gardens and backyard chickens is not the higher costs of groceries, but food security and concerns about toxicities in groceries.

Marjory Wildcraft, creator of a \$94 tutorial titled "Grow Your Own Groceries" surveyed 1,598 new gardeners to find out why they started growing their own food.

She found food costs placed a distant fourth.

"People are concerned about disruptions of the food supply due to economic collapse, pandemics, terror events, or natural disasters," Wildcraft says.

She says her training course is rapidly becoming the standard video training tool and reference source for people who want to learn how to grow food and take control of their food supply.

The USDA says the average family of four spends nearly \$15,208 a year on groceries and Wildcraft says people can grow their own groceries for much less, and get much higher quality food.

"I came from a business background and could not keep one house plant alive," she says. "But now I grow more than half of what I eat. I've learned what works and what doesn't."

Creating the videos is part of a mission for Wildcraft, who is passionate about sustainable living and self-reliance.

"I've been dedicated to finding the easiest methods for growing food on a family scale," says Wildcraft, who teaches people with no gardening or agriculture experience how to successfully grow healthy, vibrant, nutritious food.

"I wanted to do something about the chemicals in my food, genetically modified corn, depleted soils and the horror of commercial meat production. I felt vulnerable when I realized how dependent I was on huge, corporate agri-business for my food supply. The sense of security is priceless knowing that come what may, I am able to feed my family."

Her "Grow Your Own Groceries" program has been sold in more than 30 countries.

– Alan Harman

CANADIAN BEEKEEPERS GET FUNDS FOR SAFETY SYSTEM

The Canadian Honey Council receives a C\$30,000 (\$30,190) grant from the federal government in Ottawa to complete the introduction of its HACCP-based food safety program.

The Canadian bee industry safety quality traceability (C-BISQT) program gives advice to producers on how to update their on-farm food safety systems, guided by feedback from beekeepers themselves.

The money will be used to complete the process begun seven years ago by the council.

It's in the final stages, going through a technical review and creating the documentation."

Announcing the grant, Member of Parliament Joyce Bateman tells the council's annual meeting that the government's top priority remains the economy – and a safe and healthy honey sector is an important part of creating jobs and growth.

"With this investment, the Canadian Honey Council will be able to maintain the high safety and quality of their world-class honey enjoyed by consumers here at home and around the world," Bateman says.

The C-BISQT plan will undergo a thorough review by the Canadian Food Inspection Agency to ensure food safety risks during the honey

production process are mitigated.

Once the review is complete, processors will be assured that honey produced from members certified by the council is prepared using a CFIA-approved hazard analysis critical control points (HACCP)-based food safety system.

+ Council executive director Rod Scarlett says his group has pleased the Canadian government has supported the industry's quest to complete an on-farm food safety system.

"It has taken a great deal of effort and hard work from a number of producers and without the financial and moral support of the government of Canada, it would have never come to fruition," Scarlett says.

The value of honey produced in Canada in 2010 was C\$146 million (\$146.9 million) of which C\$57 million (\$57.36 million) was exported. The value of honey bees to the pollination of crops is estimated at more than C\$2 billion (\$2.01 billion) a year.

Money for the industry grant comes from the Canadian Integrated Food Safety Initiative. The Canadian government is helping organizations develop national, government-recognized on-farm and/or post-farm HACCP or HACCP-based food safety systems. – Alan Harman

HARM ... Cont. From Pg. 73

motes the next step – trimming of a small portion of the toxins by the insect's enzymes.

Meanwhile, Tabashnik's team identified lab-selected resistant strains of a major cotton pest, pink bollworm (*Pectinophora gossypiella*), in which genetic mutations altered cadherin and thereby reduced binding of Bt toxins.

The findings from UNAM and UA considered together implied that in resistant strains of the pest, naturally occurring genetic mutations changed the lock – the cadherin receptor – so that Bt toxin, the key, no longer fits. As a result, the trimming does not occur, the whole chain of events is stopped in its tracks, and the insects survive.

The researchers decided to try to trim the toxin ourselves, by using genetic engineering to create modified Bt toxins that no longer need the intact cadherin receptor to kill the pests.

In initial tests, they found the modified toxins killed caterpillars

of the tobacco hornworm, *Manduca sexta*, in which production of cadherin was blocked by a technique called RNA interference. The modified toxins also killed resistant pink bollworm caterpillars carrying mutations that altered their cadherin.

"Those experiments led us to hypothesize that any insect carrying a mutant cadherin receptor as a mechanism of resistance would be killed by the modified Bt toxins," Tabashnik says.

"We still don't know why the modified toxins were so effective against some resistant strains and not others" Tabashnik says. "The take-home message is we need to look at this on a case-by-case basis."

He says based on the lab results, "we think the modified Bt toxins could be useful, but we won't know until they're tested in the field."

"At the very least, we've learned more about the pests and their interactions with Bt toxins. In a best-case scenario, this could help growers sustain environmentally friendly pest control."

Alan Harman

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The Steuben County Cooperative Extension runs an annual event called Farm/City Day, a day for people from towns and cities to visit a real farm. Each year a different dairy farm hosts it. Activities include picking your own pumpkin, sampling local farm produce, milking a cow by hand, and of course learning about bees and honey. Mercifully, the day is short. The crowds start trickling in at 10 o'clock and the show is over at 3:00 p.m.

They placed me next to John's maple syrup display. John sold cotton candy made from maple sugar. I wondered whether or not John's cotton candy would hurt my honey straw sales.

As soon as the cotton candy machine was plugged in, John started pouring in sugar, twisting the cotton candy around a cardboard cone and stuffing it into plastic bags. His wife set up the rest of the display. By 10, they had pinned a row of bags around the edge of the canopy. As little children wandered by, Tami would lean over the table and say in a motherly voice, "Would you like to try some cotton candy?" Suddenly, a young son, Ben or Zach, would scoot around the table and hand the kid a big free wad of the stuff. Ben brought me one, too.

Beekeepers, don't try maple cotton candy. If a stranger offers you some, just say no! You'll soon be selling your bees and buying maple seedlings. *That's* the stuff the gods on Mount Olympus were eating. They just told us they were eating honey to keep all the maple cotton candy for themselves.

Overall, I had a good day. I sold some honey and beeswax, though not enough to cover my time. The honey straws paid for the day. More important than one-time sales were people who discovered I sold honey nearby – new customers. I also plugged the Steuben County Honeybee Association (www.schba.info) to anyone interested in beekeeping, and convinced several people with bees in their walls to call me in the Spring.

All this time, out of the corner of my eye, I watched John, standing like a mountain, cotton candy wrapping his arm up to his shoulder, pouring in maple sugar, swirling a cardboard cone inside the machine and pulling out wads of cotton candy. By now his parents, in-laws, and the rest of his children were helping to bag, hand out samples and sell cotton candy. The surplus long gone, a line of patient customers formed. Sometimes long, sometimes short, the line continued for the rest of the day. Every half hour or so, Ben sneaked over, a big sheepish grin on his face, to buy honey straws.

I always learn something new from these events. Here is what I discovered from Farm/City Day:

1. Competition doesn't always hurt your business. This year another beekeeper set up his stand about one hundred feet from mine. I learned that people were buying his honey straws, then, discovering that I had different flavors, they bought mine, too. When people asked if I had comb honey, I sent them to the other guy. I wondered if setting up next to a cotton candy seller and a dairy cooperative that gave away free yogurt and cheese samples would hurt business. But no, if anything, business was better than other years.

2. The more lurid and garish the colors, the more unhealthy appearing, the better kids like them. My best selling honey straws – bright blue, orange, and red resemble antifreeze. Cotton candy looks and feels just like fiberglass insulation. After feeding young children cotton candy, make sure you store your rolls of insulation in childproof containers.

3. People who take risks and benefit from their labor work longer and more efficiently than people on a salary. At closing time, exactly three o'clock, I scanned the building. The other displays in our area, the dairy cooperative and government organizations had already folded up their displays and were walking out the door. At 3:30, I still had children running up to me to buy honey straws. John still had a line. At four o'clock I tucked my cash box under my arm, and brought my van back to load. A line of people had formed, waiting for more honey straws. John was scooping up the last of his cotton candy and handing out free gobs to a crowd of children.

4. Work isn't always fun. John, I learned later, could barely get out of bed the next day. But that was just the end of a long process that started last Winter, wading through knee deep snow, tapping and running sap lines. I'll remember that next time I carry honey filled supers from the beeyard to the extracting room.

5. The power of generosity – John's daughter Emily brought me two big bags of cotton candy, "for you and Mrs. Sieling," she explained. It took us two days to finish it all. The next time Ben snuck over, I handed him a free handful of honey straws. My customers appreciated the free samples and when they passed by carrying arm loads of yogurt and string cheese, I gave out free bags.

Packed up with the van aimed homeward, John stopped me and I rolled down the window. You have a good day? He asked.

"Sure, how about you?"

"I didn't know I could make that much money in one day," he answered.

"What do you think about honey flavored cotton candy?"

"If you can turn it into a solid and mix it with granulated sugar, we'll run some through my machine."

It's not a bad idea.

Peter Sieling

Cotton Candy

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