JUN 2010

Bee Culture

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CATCH THE BUZZ

INSIDE . . .

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Drones get too little credit, too much blame, and not nearly enough good press. It's time we look again at The Joy of Drones.

photo by Larry Connor

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JUNE 2010 VOLUME 138 NUMBER 6

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DEPARTMENTS & COLUMNS

Hive Beetles Hate Light?

I have been plagued with hive beetles for several years, and had tried everything I could think of to rid my hives of them. In discussing the problem with my friend, Archie Matthews, a local beekeeper, he relayed an observation that he and Tom Douda, a retired Florida apiary inspector made.

While visiting our local Dadant & Sons store, owned by Jerry Latner, they noticed his observation hive had no hive beetles present, while the outside hives did have beetles. They speculated that the beetles don't like light. I also confirmed this idea, each time I removed the cover of one of my hives and watched the beetles run for the bottom of the hive.

I had a theory that if I put an opaque plastic cover on my hives, that the beetles would move out. I made a short trip to the hardware store and purchased a white opaque piece of Lexan plastic to try as a cover on one of my infested hives, in place of the normal wooden cover. After about only one week, I was amazed to find no hive beetles.

I then tried the Lexan cover on the other hives and got the same results – no hive beetles. As my apiary seemed to be the breeding ground for all the hive beetles in Florida, I was very impressed with the results!

I would like to share my discovery with the beekeeping community to rid ourselves of this disgusting pest. I would also encourage other beekeepers to try it in their apiaries and write the editors of the bee journals on their findings. I believe in this way, we could build a database of results and put sound scientific principles to work on the eradication of this pest from our colonies without the use of chemicals and or beetle traps.

Again, I was amazed at how quick, simple and effectively this opaque white plastic cover eradicated the beetles in every single hive. I hope other beekeepers will try it and confirm whether they get the same results.

Stephen Homewood
Gainesville, FL

Fan Of Walt's

I am a big fan of Walt Wright and the experimentation that he does with the honey bees. I hope you will continue to publish his findings as he submits them to your magazine. The first thing I do when I receive your publication is to look at who is writing the articles and I am delighted when I find you are publishing an article that he has submitted. I hope you will encourage him to continue submitting articles concerning his experimentations.

Harold Cooper
Wilkesboro, NC

Kudos To Ross

As one trained in plant pathology and economic entomology, I commend Ross Conrad for his elegant understanding of host-parasite, host-pest relationships as expressed in his article: "The Road To Treatment Free Bees" in *Bee Culture*, April, 2010.

John McKelvey, Jr.
Richfield Springs, NY

Winter Bees

Why aren't our 'Winter' bees living as long as they need to?

In North America the queen usually quits laying eggs in late September to early October depending on the latitude. Now these bees are supposed to live until March or April. The queen usually starts laying eggs again in February and by this time your Winter colony will have declined a little but they've been active for six to seven months depending on when they were hatched. This is in the old days. Now these bees born in October aren't living for six months, but probably more like three or four months. Why?

My reasoning is probably too simple, but for what it's worth – when the queen quits laying drone eggs in early July, then the Varroa try to rear its young in worker brood, it's not successful because of the time – 21 days versus 24 days. But what happens to these workers that have mites in the cells with them? They are robbed of nourishment and because of this they can't store fat like they used to. The result is a weaker bee with a life span cut short.

For example in January and February your colony looks pretty good, but come March a decline. These bees leave the hive for cleansing flights and don't come back. If you find sealed brood in March that is bigger than the bees covering it that's the reason. The queen will only lay the amount of eggs that the bees can cover. So those bees that were covering this larger brood pattern have simply died, probably outside of the hive.

If this colony becomes the size of your open hand they are doomed unless you put them above a strong colony with a screen for a couple of days, then replace the screen with a double queen. In a matter of three weeks you probably will have a quite strong hive that can be moved to another yard. Sometimes it doesn't work. The queen in the top hive disappears, probably killed by the bees in the strong hive below.

This problem isn't something new, but has been happening for about 15 to 20 years at least in my case.

One other thing – honey bees have never been studied for ailments at any time previous to so

called CCD. So perhaps some of these ailments have always been there. But everyone is looking for the cause. When the mites were introduced our troubles began. It seems that simple.

As Chris Baldwin said in his April letter "Let bees be bees." That says it all.

Jim Cowan
Aberdeen, WA

Biggest Beehive In GA

Just want you to know that a big change has been made here at the Webb Honey farm in Clarkesville, Georgia. After 11 years of enduring neighbors comments of our "Out House" in the front yard – that is our self service honey stand we use, we have built a new and unique honey stand. It is the Biggest Beehive in Georgia. Now you can really buy your honey directly from the BEEHIVE.

Virginia & Carl Webb
Clarkesville, GA

Experience Helps!

Thank you for printing Glen Stanley's letter in your March 2010 magazine. As fairly new members of the beekeeping fraternity much of his letter and years of experience were very applicable to our situation here in Southeastern Michigan.

Thus far we do not consider ourselves to be successful Apiarists because each year we've lost both of our hives during the Winter season. Of course this is disheartening, as the ladies are part of the family throughout the Spring, Summer and Fall and it's also costly!

We plan to implement the weighting aspect of Glen's suggestions, and we're clear and have done very much the same type of wrapping of the hives in preparation for Winter.

What we'd like further clarified is the middle opening technique. Two pieces of cedar shingle 1¼" wide along each side of the lower hive is clear, but what exactly is "lathe 7½" long" along the front? Does this set up create openings at the front and back of the lower hive? We don't see how the back side is closed off after adding the spacer shingles.

We greatly respect the experience of those that have done this for years and appreciate your assistance and sharing.

Ned & Jenni Glysson
Ann Arbor, MI

***Editor's Note**: Glen, can you help us out?*

Moisture In The Hive

In northern Wisconsin our Winter continues from October through mid-April so the bees are confined for a considerable length of time. Moisture was always a problem. As John Hoffman did in his most recent article I tried many wraps with little success.

In about 1959 I thought why not put the wrap on the inside, not the outside. So like the old book says the first cold day after the last warm day I take everything off down to the frames, cover the hive body top, an old shirt or towel or whatever is handy. Then I install an empty extracting super, eight inch we call them. I insert a pad of dry straw from a conventional square baler. It just fits in super.

There are three one-inch holes drilled in the empty super, covered with hardware cloth to keep mice out. Put inner cover back and outer cover on top.

I also put one-inch dense foam on three sides with front left open with tin entrance closures at bottom and one-inch hole in upper chamber for cleansing flights, weather permitting.

This is not a cure all but will keep the girls dry.

Gunder Thompson
Oconto, WI

Apitherapy & Mice

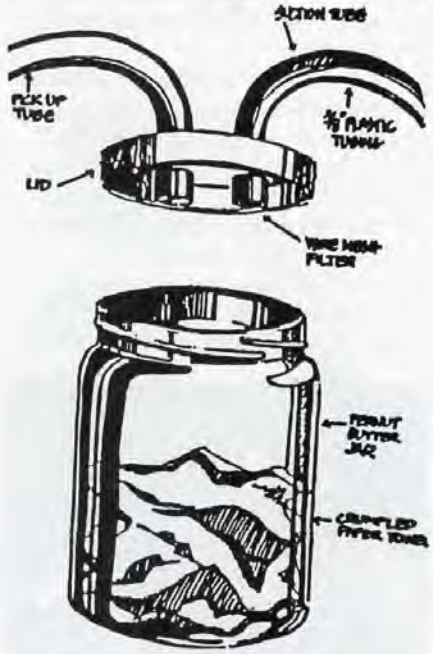
I have subscribed to *Bee Culture* for many years. To new beekeepers I always recommend *Bee Culture* as their first beekeeping magazine.

In the April issue there are two letters I wish to comment on –

Donald Chandler finds it difficult to get bees for apitherapy in the Winter. With an aspirator I was able to suck up bees any time by removing the cover, removing a frame or two to expose the cluster, and suck up bees. This aspirator excites the bees the least of any method I tried. Even when the bees are very active.

Steven March, uses ½" hardware cloth to keep mice out of the hive. I used the reversed bottom board year round. The 3/8" opening kept mice out, and did not bother the bees coming and going. This was recommended by Bill Clarke, a former columnist to *Bee Culture*.

Loren Sadler
Elizabethtown, PA



beetight

Your cell phone connection to your bees

Cameo Wood

Beetight is the future of hive record keeping. For those of you that have been keeping your hive records in notebooks or in an excel spreadsheet, you'll be thrilled by the simple online inspection interface that allows you to update and review all your inspections for all of your hives while you are in the field. Never again will you be unprepared for your hive visit, or forget your treatment or feed. Beetight lets you review and update everything from your computer at home or on the go with any smartphone with a web browser (iPhone, GooglePhone, Palm, etc). Use a Warre or Top Bar hive? No problem. Beetight supports those as well as Langstroth, the National and WBC, and even newer hives like the Beehaus. The inspection checklist is easy to use and helps you record key aspects of your hive management, such as your treatments and feeding, the temperament of your colony, and your honey harvest and nectar sources. A great thing about Beetight is that when you perform an inspection in the field on your phone, it is automatically updated on the internet, you don't need to sync your phone or perform any other action.

If you carry your smartphone with you all the time, and can't remember the last time you kept paper records, Beetight is for you. If you don't know how to use your phone for anything except phone calls and you would rather look at a catalogue than a website, then Beetight is probably not for you.

If you want to see if your phone or PDA can use Beetight, just point the web browser on your smartphone to **beetight.com** and see if it loads correctly. If it does, you are all set to start using beetight!

I always carry my iPhone around with me, and I never keep paper records around, so Beetight is perfect for me. I can update my hive while I'm working it, or review my inspection records before I leave the house to make sure that I don't need to bring feed, a treatment or another super. Once I am in the hive, if I see something interesting, I can take a photo of it, and upload it to Beetight as part of that day's hive inspection, so I can review it again later. Beetight supports one thousand hives and apiaries, and to make large-scale hive management even easier, it uses 2d barcodes so that you can just scan the hive's barcode with your phone camera, and automagically have the hive's record up on your smartphone, ready for inspection. I don't have enough hives that this is a major concern for me, but I can see how this would be beneficial for a sideliner or even a commercial beekeeper.

While Beetight is great if you live in a major city with great cell coverage, it isn't so great if you don't have signal to your phone when you are at your hive, or if you don't have a broadband connection to the internet. This product is mainly for people that already use the internet regularly, and are familiar with navigating around sites without help. If you are out at your hive and you suddenly realize that your smartphone is without battery, then you are left without any record keeping at all.

That said, I am a strong internet user and I always have my cell phone with me. My hives are in a major city, so I always have strong phone signal, and if my phone is dead, I can always plug it in close by before I go back to the hive. I've also occasionally forgotten to update my inspection while I was at my hive, and I've updated my hive inspection from home later while the details were still fresh in my mind. If you are worried about Beetight closing up shop and taking your hive inspection records with it, don't worry - Beetight allows you to download all of your inspections as a spreadsheet, so you can have offline access to your inspections if you need them.

Is Beetight right for you? Head over to **http://Beetight.com** and sign up for your free account and try using it on up to six hives. If you love it, you can sign up for the "pro" service for $15 a year which includes all new features, the ability to track 1000 hives, and the satisfaction of helping to support the developer of such an awesome product. BC

Cameo Wood is a roof top beekeeper in San Francisco, and operates Her Majesty's Secret Beekeeper bee supply store in that city – **www.hmsbeekeeper.com**.

INNER COVER

Surveys: Colony Losses, And Queens

At the end of April the now-regular Apiary Inspector's Report on Winter losses across the U.S. came out. You've probably seen the story in dozens of places. I simply want to point out a couple of things that much of the mainstream media overlooked.

First, the AIA sent out a request to fill out a survey form that was prepared and tabulated by survey software. That request reached a lot of beekeepers. It was sent to nearly 5,000 beekeepers (well, mostly beekeepers) that receive our CATCH THE BUZZ, and I don't know how many other online discussion groups sent it to their members . . . I received it about six or seven times because of the groups I am a part of and electronic mailing lists I am on. Though some are duplicates, a good guess is that at least 20,000 beekeepers saw the survey. Maybe not, maybe it was more. But that's my guess. The survey began on March 30th and was completed on April 16th. . . two weeks. 4,200 people responded in that time frame. That's not a bad return, all things considered – 20 some percent if I'm right. That's five times more than last year, and 10 times more than the previous two years. The data should be a bit more robust.

I'll get to the numbers in a minute, but the last paragraph of the Preliminary Results paper published by Dennis vanEngelsdorp, Jerry Hayes, Dewey Caron and Jeff Pettis that was published on April 22nd is important, and bears repeating . . .

"It is important to note that his survey only reports on winter losses and does not capture the colony losses that occur throughout the summer as queens or entire colonies fail and need to be replaced. Preliminary data from other survey efforts suggest that these 'summer' losses can also be significant. All told, the rate of loss experienced by the industry is unsustainable."

Here's a survey I think needs taking. In fact, by the time you get this, I'll already be taking it. I want to know how well queens are doing . . . I don't have the questions quite figured out just yet, but I've got a couple of weeks before I start . . . I want to know how well the queens that came in packages did this year, and I want to know how well queens bought separately and were put in overwintered colonies did this year, and I want to know what kind of experience the beekeepers have who answer the survey, and I want to know what kind of equipment those queens were put on, and I want to know what kind of chemical treatments were used both last year, and this spring if any. And I want to know what kind of queens we're talking about. I'll probably think of a few more questions . . . My Medina Beekeeper's Beginner's class was surveyed using this software also...it seems to work pretty well, so we'll see.

I'll start this survey before you get this issue, but I'll keep it up until after you receive this and find out about it. I'll send it out to our CATCH THE BUZZ list too, so if you want to receive it that way sign up for the BUZZ at www.beeculture.com/content/catch_buzz.cfm. I'll make sure you get it one way or another.

•

Back to the AIA numbers.

I had to ask Dennis about some of the numbers in this preliminary report because sometimes I'm dense and don't understand what others plainly see. But I have it straightened out now. Of all the people that responded, 32% of those who had losses said that starvation was a *leading* cause of death in their operations. And of all the people who reported losses, 29% said the weather was a big factor. But answers weren't exclusive, so more than one cause could be named. Meanwhile, only 5% of those reporting losses attributed those losses to CCD.

But just so you don't get confused here, recall that there are about, oh, somewhere around 1,000 commercial operations in this country. That represents, maybe 1% of all the beekeepers, figuring there's about 100,000 beekeepers in the U.S. But that 1% run about 75% of the bees in this country. You see where this is going . . . one commercial operation that loses 50% of their 20,000 colony operation is still part of that 3% who reported CCD as the cause. But that's the same as the backyard beekeeper in Somewhere, California that lost three of his six colonies to actual, real CCD symptoms.

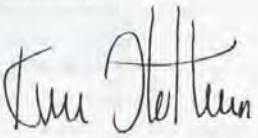
Dennis said that in the final report those abstractions would be tallied and compiled so that the per cent of colonies reported dead would also be included.

Right now it seems that about 33% of all the bees in the U.S. died last winter. Figuring there's 2.4 million colonies, that means that roughly 800,000 colonies died. If you grow almonds for a living that means about 72% of the bees you need next season died . . . and may, or may not be replaced.

And between you and me and the killing fields of corn and pesticide covered crops, some of those that are left don't look so good either.

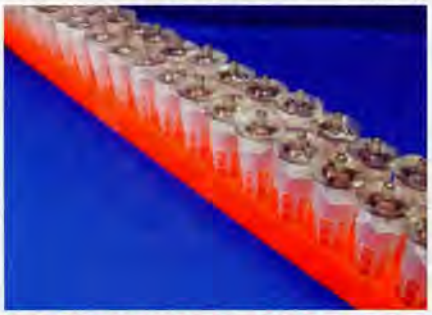
Those self-pollinating almond trees can't show up fast enough, can they?

June has the longest days and the shortest nights...that will keep you busy keeping bees healthy. To do that well you need to keep your veil tight, your smoker lit and your hive tool sharp. I still think this year is gonna be Fantastic!



New For The Beekeeper –

JZs BZs' Queen Cell Shipping Protector has became a "Top Bar Cell Protector" ready to place in the hive of the consumer. The "Queen Cell Shipping Protector" is a press fit in a JZs BZs queen storage bar and is then ready to receive Queen cells. The storage bar, (shown) holds 46 cells. With a little ingenuity the Mann Lake cardboard shipping carton can be revised to hold 250 cells. Approximately a pound and a half of bees must be added to help maintain temperature. A sheet of thin plastic must be placed over all cells to keep the bees from "gluing" the cells to the 3/4 thick Styrofoam which is placed over the entire inside of the shipping carton to hold everything firmly in place. Now it's ready for UPS



But, there's more! Some shippers complained about the cell cups falling out of the cell bar. This was caused by the variable width of the grove in the cell bar and hardness and moisture content of the wood, and occasional variable hole size if used. To eliminate these variables a plastic cell bar was developed. The holes in the cell bar, which accept the the peg of the cell cup are designed to flex and are exactly sized to provide a perfect, long lasting fit. To provide an even tighter fit, the cell cup should be rotated 90 degrees to take advantage of the elliptical cross section of the peg on the JZs BZs cup.

On the back burner is a removable candy tube which fits the JZs BZs plastic queen cage. These will be prefilled and shipped in an air tight plastic bag, ready to snap into position in the cage.

For more information on any of these contact JZs BZs Honey Co. 866.559.0525 or **www.jzsbzs.com**.

A Ton Of Honey: Managing Your Hives for Maximum Production. Grant Gillard. Self Published on CD ($14.95), as a Printed and bound copy ($17.95) or as a digital ebook ($11.95). 8½" x 11", 130 pages. No photos.

For his day job, Grant Gillard is a story teller, a healer, a soother and a pretty good disciplinarian. The rest of the time he's a pretty good beekeeper. He's also an accomplished author, with several other beekeeping books to his credit, all in this same format of electronic and paper editions.

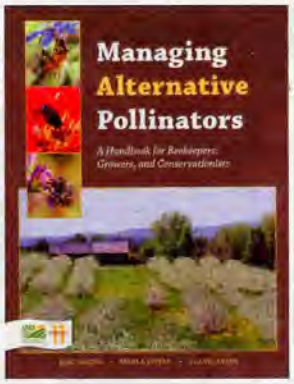
Here, in his very unique style in this book he tells you that if you want to make a lot of honey, get up off your butt and do what needs to be done, the way it needs to be done, when it needs to be done. There's nothing new here. He tells you that, too. But his easy to understand style is laced with telling tales from his own experience and other beekeepers he knows, supported with stories and proverbs that highlight the lessons to be learned.

His whole book is centered on five factors in producing the maximum amount of honey each colony is capable of producing. They are: Overwinter strong colonies; foster a rapid spring build up; prevent swarming; intelligent supering; and efficient harvesting. See, nothing new. But explained like a beekeeper would explain it to you, over a cup of coffee. And you don't have photos over a cup of coffee...it comes down to being able to explain fairly complex concepts in an easy to understand manner. And all the time there's those stories to make a point.

He has a sixth factor...location. This is a particularly interesting point from my perspective. He advocates producing some of the honey your bees will harvest by planting especially for them. This, in my opinion, deserves a lot more attention, but he addresses it far more than anybody to date, though this is changing.

The goal of this book is to get as much as possible from every hive...not the state average and certainly not less than that. It's an easy read...and you could probably sum it up in a 50 minute talk...but the information will take years to use, if you choose to get up off your butt and do what needs to be done, when it needs to be done, the way it should be done.

If nothing else, the last two pages...the making of a beekeeper... make this book worth reading. They are priceless.



Managing Alternative Pollinators: A Handbook for Beekeepers, Growers, and Conservationists. Published by Sustainable Agriculture, Research and Education (SARE) – Natural Resource, Agriculture, and Engineering Service (NRAES). Written by Eric Mader, Marla Spivak & Elaine Evans. 8½" x 11", 162 pages, color throughout. ISBN 978-1-933395-20-3. $23.50.

Eric Mader is the Pollinator Outreach Coordinator for the Xerces Society Pollinator Conservation Program. Marla Spivak is Professor of Entomology at UMN, Elaine Evans is the author of Befriending Bumblebees, and contributions were made by Mace Vaughan, the Conservation Director for the Xerces Society.

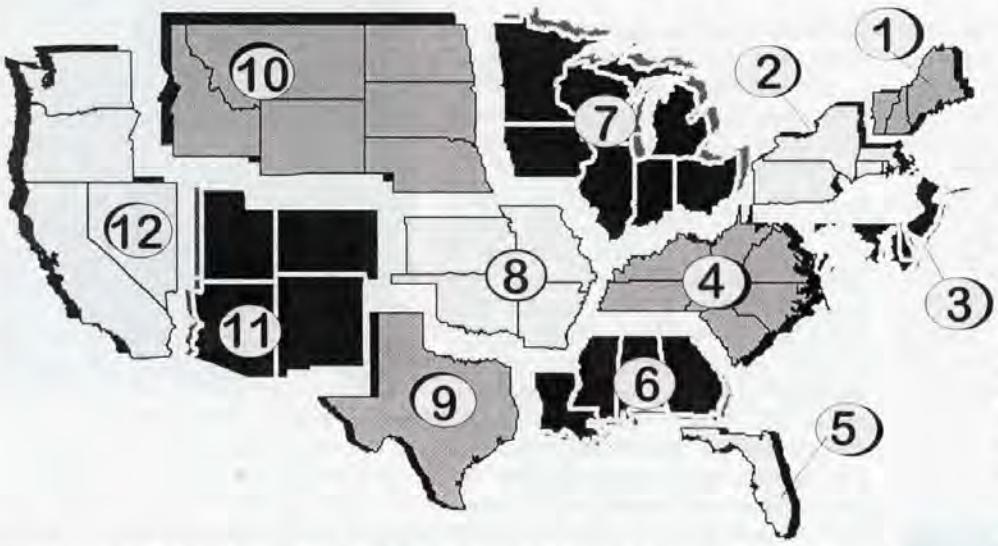
This book is about protecting, and sustaining pollinators...whether honey bees, mason bees, bumblebees, alfalfa leafcutters, or others. There is a good deal of detailed and specific information on obtaining and safely raising these bees, and there is concern about the problems they all face, and that can be had if non-native pollinators are introduced to an area. It deals with managing pests and predators that plague these bees, planting for pollinator habitat, and for bee ranching, how to make nest blocks, protect from pesticides, all about managed and unmanaged pollination, even pollination contracts.

Habitat restoration is a big part of this book, and the authors have provided lots of information on how and where to go about it, sources of seeds and plants and problem areas to avoid. They also explore farm scale nectar and pollen plant production, and again, the lists are helpful.

There's an excellent resource list, and bibliography.

This isn't a book for backyard gardeners, but they will certainly gain from reading it. And it's not only about solitary and unmanaged bees...honey bees get good coverage and beekeepers will profit from the information provided here.

JUNE – REGIONAL HONEY PRICE REPORT



The Honey Market, and What About Those New Beekeepers?

We polled our reporters this month for their take on what's going on with the honey market where they are, and any effects they are aware of because of packer consolidations, a global shortage of honey, illegal honey still causing problems and the overall pricing picture. We also wanted to see if what appears to be a significant increase in new beekeepers is as real as it seems, or maybe more local than we thought.

When asked about requests for their honey over the past year, 59% said it had increased, 38% that it had remained steady, while 3% said requests had actually decreased. A 97% response that the market has remained steady to increase is encouraging, due in part we suspect to the critical shortage of last year's crop.

Because of that healthy response, 41% of our reporters this season will increase their operations, while 55% will keep things just the way they are. Fluctuations in the market, both global and local can be short lived and doing what you do best is a strategic move. 4% meanwhile will decrease operations this year, but these are almost exclusively beekeepers who are retiring.

53% report that local honey prices this season have gone up, 45% report they are about what they have been, while 1% say they've gone down. This follows nicely the supply/demand curve, don't you think?

35% report that non-local honey prices have increased, but fully 57% report that these prices have remained steady, while 7% report actual decreases in non-local honey prices. This would indicate, perhaps, that inexpensive foreign honey isn't having much effect on these local markets, which is generally the case since that product tends toward the food industry rather than store shelf sales.

Supply has another side in that 31% or our reporters indicate there are fewer local beekeepers selling honey this year...so less honey, fewer beekeepers. Makes sense.

Finally, what about all those new beekeepers we keep hearing about? Well, 30% of our reporter tell me that they have REALLY increased this spring, 28% report some increase, 31% say the numbers are about the same as every year, while 11% actually report fewer than normal...So perhaps the surge is more local than we thought, but where it's working, there's lots of new folks taking up bees.

	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	1.55	1.65	1.55	1.52	1.55	1.48	1.57	1.60	1.55	1.60	1.51	1.65	1.48-1.65	1.56	1.56	1.50
55 Gal. Drum, Ambr	1.51	1.55	1.51	1.51	1.50	1.34	1.57	1.50	1.40	1.51	1.44	1.60	1.34-1.60	1.49	1.48	1.37
60# Light (retail)	130.00	126.33	130.00	135.00	120.00	121.67	124.20	134.84	116.00	135.11	148.75	160.00	116.00-160.00	131.83	132.28	129.24
60# Amber (retail)	130.00	116.67	130.00	128.75	120.00	120.00	113.40	135.00	117.50	122.49	143.33	151.48	113.40-151.48	127.39	125.46	121.81
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	55.20	65.32	45.60	54.20	66.37	50.75	53.00	66.37	66.37	42.00	58.80	87.53	42.00-87.53	59.29	65.35	55.57
1# 24/case	67.56	87.82	72.00	70.39	98.00	74.98	80.92	82.02	68.36	97.44	79.16	102.50	67.56-102.50	81.76	82.90	79.04
2# 12/case	73.80	73.05	66.60	62.78	94.50	73.11	71.00	78.00	62.53	75.00	61.60	83.50	61.60-94.50	72.96	71.77	66.84
12.oz. Plas. 24/cs	68.16	77.98	50.40	69.79	60.00	63.30	61.16	69.48	51.84	57.60	64.70	69.73	50.40-77.98	63.68	66.35	60.31
5# 6/case	87.81	82.74	78.00	71.90	68.03	68.03	80.10	82.28	63.50	80.40	62.85	86.00	62.85-87.81	75.97	75.22	76.12
Quarts 12/case	123.89	131.20	123.89	106.57	96.00	99.19	101.60	102.00	120.00	108.00	94.23	125.00	94.23-131.20	110.96	106.82	103.00
Pints 12/case	67.70	76.48	67.70	70.20	61.50	51.40	71.40	61.69	62.10	73.92	52.67	69.50	51.40-76.48	65.52	63.27	61.03
RETAIL SHELF PRICES																
1/2#	3.00	3.59	2.96	3.08	2.29	3.33	2.83	2.99	2.99	2.72	3.17	4.25	2.29-4.25	3.10	3.03	2.97
12 oz. Plastic	3.50	4.22	3.83	3.86	4.33	3.97	3.52	3.61	3.66	3.43	3.99	4.46	3.43-4.46	3.86	3.75	3.79
1# Glass/Plastic	3.63	4.95	5.10	4.44	5.25	4.97	4.36	4.62	4.23	4.45	5.34	6.88	3.63-6.88	4.85	4.70	4.72
2# Glass/Plastic	7.50	7.75	9.31	7.78	8.15	8.64	8.12	8.65	7.07	7.42	8.22	9.50	7.07-9.50	8.17	8.21	7.95
Pint	7.77	8.25	7.77	6.43	6.13	6.60	8.10	6.72	7.50	7.66	7.61	10.00	6.13-10.00	7.55	7.49	6.90
Quart	12.48	12.98	12.48	10.59	10.30	10.88	9.18	10.56	11.00	13.30	10.70	14.75	9.18-14.75	11.60	12.76	10.75
5# Glass/Plastic	17.00	15.89	21.97	16.95	20.98	20.98	16.98	18.66	18.00	17.00	18.90	22.90	15.89-22.90	18.85	17.10	18.53
1# Cream	6.35	6.29	6.50	5.74	6.35	6.35	6.08	6.19	6.35	4.90	6.30	6.91	4.90-6.91	6.19	5.76	5.12
1# Cut Comb	6.50	5.59	6.50	5.31	7.15	5.17	6.75	6.00	7.15	9.50	7.00	8.50	5.17-9.50	6.76	6.61	6.78
Ross Round	7.05	4.31	6.50	4.93	7.05	7.05	7.31	6.50	7.05	7.05	7.28	8.00	4.31-8.00	6.67	6.41	6.26
Wholesale Wax (Lt)	2.25	3.75	2.50	2.94	2.15	3.58	4.62	3.67	4.50	5.00	3.27	3.88	2.15-5.00	3.51	3.22	3.52
Wholesale Wax (Dk)	2.25	3.06	2.50	2.74	2.00	3.40	3.98	4.00	4.15	4.15	3.08	2.60	2.00-4.15	3.16	3.02	2.89
Pollination Fee/Col.	90.00	82.50	70.00	45.50	125.00	46.00	51.67	60.00	72.00	86.85	63.33	121.25	45.50-125.00	76.17	80.30	76.78

a closer look

GROOMING

Clarence Collison
Audrey Sheridan

Grooming behavior has a significant effect on Tracheal mite infestation.

Grooming behavior serves two major purposes for honey bees: 1) the removal of foreign particles and pollen from the branched body hairs and body on which they collect, and 2) the removal of parasitic mites – particularly the tracheal mite, *Acarapis woodi* (Danka and Villa 1998, 2000) – or other ecto-parasites (such as bee lice). An individual honey bee may groom herself (auto-grooming) (Jander 1976), or one bee may groom another bee (allo-grooming) (Evans and Spivak 2009). Auto-grooming is a genetically-mediated trait, which has been enhanced in hygienic bees to produce stock with greater tracheal mite resistance. Bees with enhanced hygienic behavior groom themselves with their mesothoracic (middle) legs as the mites exit the pro-thoracic spiracle, thus preventing the mites from dispersing to a nestmate.

Honey bee colonies with this type of genetic resistance can prevent problems with tracheal mites because they are able to maintain mite populations below harmful levels. Several potential mechanisms of bee resistance to tracheal mites have been evaluated, but only auto-grooming has been shown to explain the resistance of young (<24 hours old) workers (Villa 2006). Resistance appears to be regulated little if at all by allo-grooming (Danka and Villa 2003).

Infestations of tracheal mites were measured in honey bees whose auto-grooming ability was compromised by having legs or segments of legs amputated (Danka and Villa 1998). Bees of two stocks, one more resistant (Buckfast) and one more susceptible to tracheal mite infestation were tested by performing amputations on uninfested, 0-24 hour-old adult bees, exposing the treated bees to mites in infested colonies, then retrieving and dissecting the bees to measure parasitism. In both stocks, bees that had mesothoracic legs amputated had increased numbers of mites. The relative increase in mite infestation was greater in resistant bees. Mite infestations continued to increase as more (0 vs. 1 vs. 2) mesothoracic legs were removed. In bees with only one leg removed, mite infestations were greater on the same side. In subsequent tests with resistant stock bees only, removing the mesotarsi resulted in infestations equaling those found when entire mesothoracic legs were removed, but amputating the four distal mesotarsomeres or the metatarsi resulted in less significant increases. Restraining rather than removing mesothoracic legs also resulted in increased infestation. Young (0-24 h) bees were more affected than older (three to four days) bees by leg removal, indicating that a factor other than auto-grooming accounts for the low susceptibility of older bees to tracheal mites. Together these results are evidence that auto-grooming is an important mechanism of protection against tracheal mites, especially in bees known to have genetically-based resistance to the parasite.

Studies have shown that allo-grooming is in part genetically determined (Frumhoff and Baker 1988, Kolmes 1989). Allo-grooming occurs primarily on the thorax and especially around the wing bases (Božič and Valentinčič 1995) where tracheal mites are found during dispersal. Tracheal mite dispersal success increases at night (Pettis et al. 1992) and perhaps grooming behavior may vary from day to night. The performance of allo-grooming and the grooming dance by worker honey bees varied significantly with time of day, worker age and genotype (Pettis and Pankiw 1998). Observation hives monitored over 24 hours revealed that dancing increased significantly at night while allo-grooming decreased. In 32 mite-infested observation hives

"Self grooming is effective. Grooming by other bees isn't."

the percentage of bees infested was positively correlated with allo-grooming acts and dances observed. In a third experiment, young marked bees were introduced into three hives with 0, 50 and 70% tracheal mite prevalence and grooming dances increased in the bees one to three days of age in the mite-infested colonies. They postulated that mite movement on young bees elicits the grooming dance. Bees from four different single patrilines that had exhibited different propensities to allo-groom or dance were marked and placed into eight mite-infested colonies for five days. Dissection of marked bees revealed that the allo-grooming line was most susceptible and the dancing line least susceptible to mite infestation. They postulated that the dancing line of bees had a lower threshold for detecting mites on their body resulting in increased dance behavior and auto-grooming which they believe lowered the number of mites that transferred to these bees.

Auto-grooming by workers involves midleg movements anteriorly over dorsal areas of the thorax and is usually accompanied by a grooming dance (Hydak 1945, Land and Seeley 2004). The grooming invitation dance is also closely associated with allo-grooming. Božiè and Valentinèiè (1995) observed that the grooming invitation dance elicited an allo-grooming response 72% of the time. A worker bee producing the dance stands stationary and vibrates her whole body from side-to-side at a frequency of 4.2 ± 0.2 Hz for 9.3 ± 1.0 seconds. Sometimes the bee mixes bouts of body vibration with brief bouts of self-grooming (average duration = 1.4 seconds). Bees that perform the grooming invitation dance have a far higher probability of being quickly groomed by a nestmate than do bees that do not perform the dance (Land and Seeley 2004). Bees that had chalk dust puffed onto the bases of their wings produced significantly more grooming invitation dances than did control bees that received only puffs of air. This shows that it may be the accumulation of small particles at the bases of the wings that normally triggers the dance.

This grooming dance was originally described prior to detection of tracheal mites in the United States and occurs even in colonies with no tracheal mites (Pettis and Pankiw 1998). However, colonies with high infestations show a higher frequency of grooming dances (Pettis and Pankiw 1998) and workers observed auto-grooming are much more likely to have migrating female mites on their thorax (Danka and Villa 2005). Additionally, young resistant bees are more likely to engage in the behavior than susceptible bees when challenged with individual mites (Danka and Villa 2003).

Danka and Villa (2005) evaluated the difference in tracheal mite infestation between nestmate honey bees that were actively auto-grooming and those that were not. Bees seen to be actively grooming themselves in an observation hive were immediately removed through a door, narcotized and searched for mites. Nearby bees that were not grooming also were taken and examined. A strong association was found between the act of auto-grooming and the presence of tracheal mites, with mites found at a four-fold greater frequency on the thoraxes of grooming bees (36/50 with mites) than on non-grooming bees. Mites were found most commonly on the metatergum and the propodeum, and near the wing bases. There are significant differences between resistant and susceptible bees in their propensity to auto-groom in response to the presence of tracheal mites (Pettis and Pankiw 1998, Danka and Villa 2003).

Auto-grooming responses of resistant and susceptible strains of honey bees were measured when bees were challenged by placing adult female tracheal mites on their thoraces (Danka and Villa 2003). A single, live, adult female mite was placed onto the mesoscutum of a marked bee, monitored the bee for seven minutes and then removed it and searched for the mite. Greater proportions of resistant bees auto-groomed, and resistant bees made more grooming attempts. Bees of both strains had equal apparent grooming effectiveness; grooming bees lost approximately 75% of the mites. Control-group bees (those only stroked with the brush used to transfer mites) of the two bee strains did not differ in any response parameter. Resistant bees may have a lower threshold for responding by auto-grooming when stimulated by mites on their body.

Worker honey bees from genetic strains selected for being resistant (R) or susceptible (S) to tracheal mites typically show large differences in infestation in field colonies and in bioassays that involve controlled exposure to infested bees (Villa and Danka 2005). They used bioassays exposing newly emerged individuals to infested workers to compare the propensity for tracheal mites to infest queens, drones and workers from R and S colonies.

In tests with queens, newly emerged R and S queens were either simultaneously confined in infested colonies or individually caged with groups of 5-20 infested workers. Mite prevalence (percentage of individuals infested) and abundance (foundress mites per individual) after four to six days did not differ between R and S queens. In another test, five newly emerged drones and workers from both an R and S colony, and a queen from one of the two strains were caged in each of 38 cages with 20 g of workers infested at 60-96% prevalence.

Infestations of the R queens and S queens did not differ significantly, but R workers had half the mite abundance of S workers, while R drones received about a third more migrating mites than S drones. In tests to evaluate possible mechanisms, removal of one mesothoracic leg from R and S workers resulted in two- to 10-fold increase in mite abundance on the treated side, but excising legs did not affect infestation of the corresponding trachea in drones. This suggests that differences in infestation between R and S workers, but not drones, are largely determined by their ability to remove mites through auto-grooming.

De Guzman et al. (2002) hypothesized that Russian bees showed resistance to tracheal mites either by auto-grooming, allo-grooming or removal of invading non-Russian infested workers. The role of auto-grooming in controlling tracheal mites in Russian and susceptible colonies was evaluated by gluing together the middle legs of workers and exposing them to mite infestation (Villa 2006). In one experiment, young workers (less than 10 hours old) from both strains having midlegs glued together at the tarsi or left unglued as controls were introduced into colonies with 50 to 75% of workers infested and retrieved after five or six days. Russian and susceptible workers with glued legs had very high mite abundances (8.2 and 7.9 female mites/

worker). However, control workers had significantly lower infestations and the two strains differed significantly (Russian = 1.5, Susceptible = 3.0 female mites/worker). The auto-grooming efficacy of Russian workers appears to explain the resistance of their colonies to tracheal mites. This same mechanism was shown to be important in the tracheal mite resistance of Buckfast bees (Danka and Villa 1998, 2003).

The pattern of inheritance of tracheal mite resistance in selected Russian bees was determined in bioassays and in samples from field colonies (Villa and Rinderer 2008). Resistant colonies of Russian origin and colonies selected for high susceptibility in the United States were used to generate divergent parental populations. Seven groups of F_1 colonies were produced by crossing queens and drones from these selected resistant Russian and selected susceptible populations. In a series of bioassays with young workers exposed in infested colonies, average mite abundance (female mites per worker) in F_1 colonies were intermediate and significantly different from that of both resistant Russian and selected susceptible colonies. Colonies representing the three populations were established in two apiaries in July 2005. Colonies surviving with original queens after 10 months had mite prevalence supporting the findings of the bioassay. All three resistant colonies had undetectable mite levels, whereas prevalence in four F_1 colonies ranged from 0 to 53%, and in 10 susceptible colonies ranged from 0 to 90%. Tracheal mite resistance in Russian bees is likely polygenic (under the control of several genes), but there may be a number of genes with major dominance interacting with minor genes. BC

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Women & Beekeeping In Langstroth's Time

Tammy Horn

Discrimination, success, marriage and common sense all were part of the discussion.

Lorenzo Langstroth's moveable frame hive improved social paradigms for nineteenth century women in subtle ways. Langstroth's concept was timely, not just for a world waiting for the manageable hive, but for a country torn apart by war and fluctuating economic swings. With many women widowed or delegated to primary income earner status after the Civil War, they found that commercial beekeeping could be a way to balance family and finances with "no prejudice to encounter; no loss of social standing as may be the case in some other employments," in the careful words of nineteenth century beekeeper Cyula Linswick.[1] When the first Mother's Day celebrations began in 1870, women already had an impressive record as commercial beekeepers, association presidents, and conference attendance.

More importantly, compared to earlier centuries and other continents, nineteenth century women beekeepers maintained a very public record of their experiences in North America. Print media and an increasingly-reliable postal service were readily available. Both *American Bee Journal* and *Gleanings in Bee Culture* (hereafter referred to as *Bee Culture*) printed letters from women expressing anxieties, pride, sadness, and glee. For many, writing was a way of finding their identities beyond their communities. Like floodwaters make an indelible impression upon the foundation of a house, so too do these women's letters mark collective regret, happiness, loneliness, independence, and intelligence as more women became skilled keepers only to recede from public view.

Mrs. Lucinda Harrison

Most surprisingly, marital "dirty laundry" was aired in the bee journals, reflecting how women's divorces could affect their professional reputations. For instance, in the March 1876 issue of *American Bee Journal*, there is a brief note indicating that Mrs. Spaid's Honey House in New York had closed. At first glance such a notice strikes one as an unfortunate turn of an economic tide. But Mrs. Spaid had been married to Mr. Perrine, the man who first tried migratory beekeeping on the Mississippi River. In an argument about honey adulteration, a particularly vociferous M.M. Baldridge accused Mrs. Spaid of slandering Mr. Perrine's honey in order to drive up a market for New York honey. According to Baldridge, Mrs.Spaid had become jealous of Mr. Perrine's fortune.[2]

Was Mrs. Spaid adulterating her honey? Was this why the Honey House closed? Were people shunning the business once she remarried? We will never know. But to his credit, upon seeing the letters printed in *ABJ,* Mr. Perrine wrote to Baldridge clarifying the cordial situation between him and Mrs. Spaid. Baldridge wrote a letter titled "Amende Honorable – Errata" published in *American Bee Journal* softening his stance.[3] Mrs. Spaid never wrote to defend herself or explain why the Honey House closed.

Motherhood was constantly addressed in the letters and articles. Many women were concerned about the difficulties of balancing beekeeping with motherhood. Writing in 1885, Mrs. L.M. Crockett wrote that "women that left the care of her family for some other employment stepped down – for what higher holier calling can a woman follow than caring for her family?" She backs away from an either/or choice implied in her initial question. Instead, she suggests that if a husband is interested in beekeeping, then a woman should interest the entire family in beekeeping.[4]

One of its most formative beekeeping families began with a wedding gift to Florence Weaver. The first of eight children, Florence Somerford brought ten bee hives as her wedding dowry to her marriage with Zachariah Weaver in Navasota, Texas. Her brother Walter gave them to her, never imagining that the Weavers would become an international bee business for five generations. In fact, even as children, Walter and Florence shared a mutual passion for bees, combining their resources to order A.I. Root's *ABC and XYZ of Beekeeping* and subscribed to the magazine, then called *Gleanings in Bee Culture.* No doubt Florence needed the honey and beeswax because, since her mother had died, she assumed responsibility for her siblings' upbringing.[5]

While Walter went to Cuba to make his fortune in

honey, Florence and Zachariah stayed in Navasota and reared queens and children. She took responsibility of 32 children, only eight of them her own. Thus, when asked for a word to describe his mother, grandson Binford exclaimed, "Indomitable."[6]

Leadership was also proudly announced. An especially feisty speaker named Mrs. J.N. Heater of Columbus, Nebraska, presented a paper titled, "Woman as a bee-keeper" at the 1893 Nebraska Beekeepers Meeting. Regarding her ability to keep bees, "I never did feel willing to grant to the lords of creation exclusive rights to anything," she flatly declared.[7] Mrs. Heater managed an apiary of 150 colonies. She was the Cover Girl of the September 1895 issue of the *American Bee Journal*.[8]

My favorite 19th century writer Lucinda Harrison proudly crowed about a female colleague who was voted president of a bee association: "Hit him again! Knock the chip off his shoulder! Mrs. Cassandra Robbins of Indianapolis, Ind. was President of the Indiana State Beekeepers Society for 1884."[9] Other women ended up being announced as presidents, but the strong assertive voice of Harrison leaps off the microfiche even after all these years. In an era when women were not allowed to vote and supposed to stay home, such leadership positions were more than just symbolic gestures. These public positions suggested deference to a woman's bee knowledge, respect for her ability to organize, and trust in her character.

The practical aspects of beekeeping were discussed. When a colony had turned into robbing bees, Harrison recommended stuffing the entrances saturated with oil kerosene. "It is amusing to see how soon the marauders are converted into law-abiding subjects."[10] Harrison also suggested that "the man who will keep his bees in old dirty rotten hives deserves not only to have them in his hives but also in his coffin."[11]

Regarding swarms, Harrison recommends "eternal vigilance is the key-note of success in beekeeping." When her partner complains about Lucinda's maintenance schedule, she writes: "I confess to a weakness for wanting my own way, and I generally manage to get it as far as the bees are concerned, since the minister who married us did have 'obey' in the marriage ceremony." Part of the business of swarm prevention is "pulling hives to pieces," she writes, and in order to have queens on hand, "save surplus queens from the best colonies, and then they will be ready for use if any vacancies occur."[12]

Conducting a branch business near the home office is the general tenor of the things represented. The two girls have been on a still hunt, and have made a grand "catch." The girl holding the bees certainly has about her "an air of unconscious ease" that meets all the requirements of the case, considering the possibilities bound up in that swarm. And equal praise ought to be given the other girl for standing so calmly by. But after all, what is there to make a bee made in the presence of such womanly gentleness on the one hand and gentle womanliness on the other, in so beautiful a yard, near so fine a home? Never were bees under obligation to behave better than here. Some might wonder why no man is to be seen. Two took to his heels; second, the girl with the bees is looking at him while he takes the picture, hence he is invisible.

The open hive, with all its furniture, certainly offers as good a home for the bees as can possibly be imagined; and it seems a pity that they can never know what man has done for them. The whole picture, although rigidly true to life, reminds one of those dreamy idylis of the poet – a thing we often wish to see, but never find; and it fills the heart with love for our country to think we have a nation of homes like this – differing in details, of course, but still the abodes of comfort and virtue. A "love story" has been suggested. What else does the picture show, from corner to corner? And what physical substance better represents the noblest of all human feelings than honey as a type of love? (taken from 1905 ABC & XYZ)

The business aspects were duly noted. Mrs. Francis Dunham advertised her version of comb foundation. Lizzie Cotton advertised her book and queens, and in the days before classified ads, some even advertised for jobs. Mrs. A.S. Keyes wrote to the *American Bee Journal* requesting employment as a bookkeeper and typist in exchange for tutorials in the bee business.[13] Appeals to help fellow beekeepers were solicited, a tradition that continues until the present. Rev. Langstroth often accepted the generosity of the beekeepers. His daughter, Anna Cowan, wrote letters to the committee treasurer, the same Mrs. Francis Dunham who manufac-

The North American Beekeepers Association – October 1896. That's A.I. Root in the center. There were quite a few women in attendance.

tured her own foundation. Langstroth's last years were easier because of this financial assistance.

Disgruntled women aired their complaints and frustrations. In one letter, the writer complained about the discourtesy shown to female Association members at the Chicago convention:

> *I came to learn all that I could, and put up at the hotel to converse with beekeepers, but I was expected to go up into the parlor, and the men remained below in the 'office' where it would not have been considered proper for me to remain . . . I do not want any favors in a bee meeting on account of sex. But there were ladies present who cared nothing about apiculture and they came with their husbands to see the city . . . the idea of ladies voting as members of the Association that hardly know a bee from a hornet.*

She finally concluded with a plea: "There is a great deal said now about employment for women, and they will be crowding the ranks of beekeepers, and do let them have a chance."[14]

The editor Thomas Newman of the *American Bee Journal* responded in kind: "Some of the matters complained of can only be corrected by the advancing sentiment of the age, such as hotel etiquette, etc."

Considering virtually no federal support for women existed during the 19th century, women beekeepers made courageous strides and suffered tremendous losses. The Married Women's Property Act of NY (1848; amended 1860) passed only two years before Langstroth's moveable hive was designed. Many states followed likewise. For many women who had been unable to make wills, conduct transactions, or rent/sell land, this state law was as much of a high-water mark as the moveable frame hive.[15] The moveable frame hive offered a viable way for women to increase income. With a state law and moveable frame hive in place, the United States became a more equitable country for 19th century women beekeepers. BC

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Endnotes

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What Almonds Are To U.S. Beekeepers, Canola Is To Canada's Beekeepers

CANOLA

A pollination success story now moving to the U.S., too!

Heather Clay

Canola is a Canadian success story. This oilseed crop has brought prosperity to many canola growers in the prairies. Over the last few years it has also contributed to an unprecedented growth in the number of honey bee colonies for pollination of hybrid seed canola. There are many challenges to supplying bees for pollination on time and on budget. Following is an overview of the canola industry and honey bee pollination.

Canola is an oilseed crop that was developed in Canada from a low acid cultivar of rapeseed. The species name is *Brassica napus* and this is the main species grown. *Brassica rapa* has a shorter growing season which is great for some areas of Canada but it does not yield as much oil as *B. napus*. The name Canola comes from the term CANadian Oil Low Acid. There is a strict definition of canola, which has been codified in Canadian law. It only applies to an oilseed that has less than 2% erucic acid (a crystalline fatty acid that is not good for your heart) and less than 30 micromoles of glucosinolate (a compound that binds some unpleasant tasting alkaloids that are released on eating).

Development

The crop was developed in the 1960s by plant researchers Dr. Keith Downey, Agriculture Canada, Saskatoon and Dr. Baldur Stefansson, University of Manitoba, Winnipeg. Canola was introduced to Canadian farmers in 1968. In the race to develop the low acid varietal, technicians, Martin Mallard and Burton Craig at the University of Saskatchewan built a gas chromatograph before the equipment was commercially available. This innovation saved a month of turn around time in sending samples away for testing for erucic acid and glucosinolate levels. Interestingly there is a beekeeper connection, Paul Pawlowsky, manager of the Honey Co-op had a brother Sid who worked for Keith Downey on the canola program, the Pawlowskys supplied the bees for the pollination trials.

Production

Canola is grown commercially mostly on the prairies in Canada. In 2008, 16.6 million acres (6.6 million ha) were planted and the acreage is expanding. There are 52,000 canola producers. Canada is the largest single producer of canola in the world.

Production was 12.6 million tons of canola seed in 2008 at a value of $13 billion. Some of the crop went to the 13 crushing plants in Canada and was sold as meal for animal feed and oil for the food industry (canola seed has 42% oil and 58% meal). Some of it was shipped as seed for production of biofuel. Some of it was sold as certified hybrid seed canola. Some seed is sent to Australia or South America to grow in the opposite season to be returned as parent seed for the following year in Canada. Sixty percent of Canada's exports of canola meal are to the U.S. They are a net importer of canola. Almost half of the canola oil seed crop was shipped to China in 2008/09. Japan, U.S., Mexico and Saudi Arabia bought the rest. Production is expected to be down in 2009 so the record exports may not be repeated.

What Is In A Name?

Over the past 15 years some innovations were made using recombinant DNA technology for producing seed with herbicide tolerance. This has created a lot of controversy. The terms transgenic, genetically modified, genetically transformed, genetically engineered have been used in very derogatory ways to describe the new bio engineered seed. Some EU countries have banned GM products. Some has gone so far as to call it "frankenfood." To this group of detractors, Percy Schmeizer, a canola farmer from Humboldt Saskatchewan is a hero. Monsanto claimed he was growing their product without paying the royalties. Percy claimed the wind and bees contaminated his plants with pollen from neighboring GM crops. The judge believed Monsanto but Percy is making money as a guest speaker in countries such as UK and India and providing them with anti GM information.

On the other hand canola that has been bio engineered is also called less inflammatory names such as PNT (plants with novel traits), high yield, non conventional, herbicide tolerant, pedigreed canola and the most commonly used and politically correct term is hybrid canola. Interestingly, the religious Hutterite colonies who farm communally live a simple life and believe in low impact farming, have embraced hybrid canola because they believe it saves excessive amounts of pesticides and herbicides.

The Players

The main players in the Alberta hybrid seed industry are Monsanto with Round Up ready seed. BayerCrop Science with their Liberty Link seed, and Pioneer Hi-Bred which grows BASF brand Clearfield variety. Hi Tech Production grows seed for other companies and is a smaller company among the giants. Around 50% of the canola seed planted in Canada is Roundup Ready, 30% Liberty Link, 15% Clearfield (not GM but a mutagenic variety) and 5% are conventional. All of the seed companies have seed production units and all employ agronomists to advise the farmers and supervise crop production.

Canola and Bees

Commercially grown canola is predominantly a prairie crop. It is so common that 80% of Canada's honey crop is from canola. This amounts to 50 million pounds per year of Grade No 1 white honey. It is almost impossible for bees to avoid encountering GM plants. However in 15 years of GM canola production there have been no verified complaints about the effect of GM crops on honey bees. Approximately 300,000 colonies harvest open pollinated canola. The expanding hybrid seed production industry, where farmers produce seed under contract to the seed companies, required 80,000 colonies in 2008 for pollination in southern Alberta.

Canola Requirements

Hybrid seed canola is grown in southern Alberta. Although other areas in Canada meet a lot of the criteria, this area meets all the requirements for heat, water, soil and isolation. The zone is centered around the 13 irrigation districts between Lethbridge in the south to Calgary in the north and east through Brooks and Medicine Hat. Here water is readily available to provide the 19 inches (480 mm) required by this crop. Days are mainly sunny, day length is 18 hours and there are sufficient degree days for rapid growth. Farms are measured in sections (640 acres) which provide good isolation for canola varieties.

Canola Planting

Seeding canola starts in late May. The parent stock consists of two genetic lines. They are planted in rows or "bays." The bays are planted in a ratio of 1:3 or 1:4 male to female plants depending on the company preference. The female flowers are male sterile so pollen must be transferred from a plant in the male bay. The crop is 90% dependent on honey bees. Honey bees are introduced at day 45 to provide this pollen transfer. Plants in the male bays will produce seed if left but they are mowed early to eliminate any potential for unwanted seed. The crop is certified by Canadian Food Inspection Agency inspectors for isolation, rogue plants and plant type.

Spraying

The agronomists advise when and where the sprays will be applied. Usually the crop is dusted with a fungicide to prevent sclerotina, a month before the bees are brought in. If there is a need for an insecticide during pollination period the agronomist will order Decis®, a low risk pyrethroid. Most canola seeds are now treated with systemic insecticides such as Gaucho® (imidacloprid), Poncho® (ehlothianidin) or Helix® (thiamethoxan). Although there is an expressed concern by many beekeepers around the world about the use of systemics, the experience in Canada is that we have had 10 years of large scale use on canola with no observed ill effect. This is not to let the systemics off the hook as there are some valid concerns about the application methods and residues in some other crops. In the past there were more complaints from beekeepers about Lorsban (chlorpyrifos, an organophosphate) and Sevin (carbaryl or l-napthyl methylcarbamate). For canola, the seed treatments, when applied according to label specifications do not appear to be an issue.

Contracts

All seed companies have contracts with growers and beekeepers. For the beekeeper it lays out the expectation for timing of arrival and departure, as well as the arrangement of payment depending on colony strength. Fees range from $110-$150 for 10-17 frames of bees and the quality is verified by the seed company.

Timing

Timing is very important as the crop is in bloom 45 days after seeding. Honey bee colonies are moved in to the fields over a period of 10 days starting June 20th. They are moved out again starting July 20th. While on the field the colonies are supered twice.

Challenges

There are many challenges for the beekeeper pollinating hybrid seed canola. Like any pollination venture it is a high capital investment. It requires an investment in moving equipment, forklifts, and trucks as well as a palletized system for the hives. Larger trucks bring their own issues with need for driver training and Class 3 licenses and adequate road access.

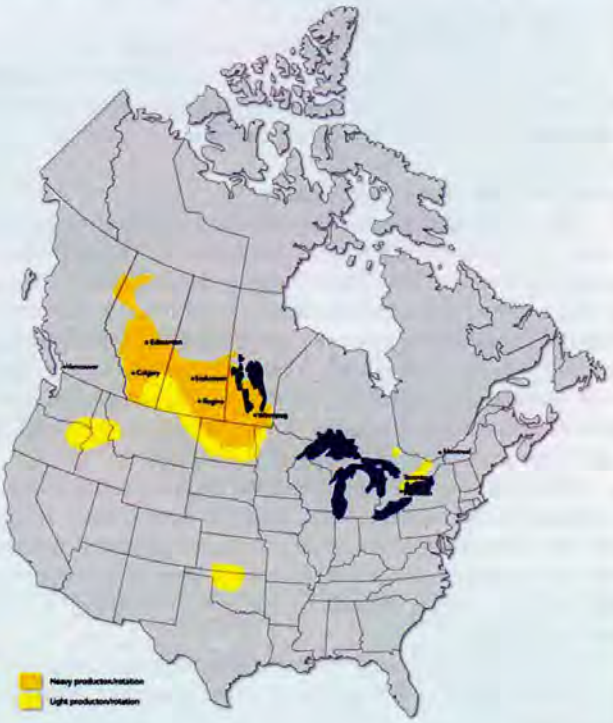
Staff is a big issue. Day length can be 18 hours and the work intense. Workers often prefer to work 12-14 hour days and have time off rather than work in shifts. Local seasonal workers are hard to recruit in rural areas and there are not enough young people interested in working in the apiculture business. Foreign workers are frequently hired to fill the gap. They come from Mexico, Central and South America and the Philippines. This brings its own issues of language, housing and transportation, not to mention the hassles with government departments such as Health Canada, Human Resources and Immigration Canada.

In southern Alberta it can still be light at 11:00 p.m. in mid Summer. Trucks usually move bees between 11:00 p.m. and 4:00 a.m. Since canola is rotated on a four year basis, the drop off for pollination is different for three years in a row. GPS is an important piece of equipment to help new crews find the fields. One beekeeper reported arriving to find hives already at the location. He was upset at the waste of time and walked in to see whose bees they were. It turned out they were his. He had dropped them off via a different access road and then drove a full circle to what he thought was the next drop. Access can be a problem in the middle of the night, finding unlocked gates and setting down in the right spot. Agronomists want the best coverage for pollination. It has been known that beekeepers have been instructed to drop off in the center of a field. The next day the hives were soaked because it was also the center of the pivot irrigation. Of course there is the problem of mud if it has been raining and prairie soils are, to quote a local expression, "slipperier than snot."

A problem disease called clubroot is spreading. Beekeepers are now asked to use hygienic practices by washing their trucks and equipment between yards to help prevent the spread of the disease. This adds time and effort to each trip.

Agronomists are very knowledgeable and are hired for their expertise. Generally things go smoothly especially with experienced agronomists who know where and when to place honey bees and who appreciates the need not to spray when bees are in the field. Some of the larger beekeepers can work with 10 different agronomists each wanting a different sequence of events.

Canola Growing Regions of Canada and The U.S.



A lot of agronomists want 50% honey bees and 40% leafcutter bees for pollination. It can be disconcerting for the beekeeper to drive in and find leafcutter shelters placed where the honey bees are to be dropped.

Very little nectar is collected from hybrid canola and the fee for rental reflects this fact. The crop can vary from 10-50 pounds (2-22 kg) per colony depending on canola variety, nectar sources from plants in surrounding fields and the stocking density. Canola honey crystallizes quickly and this has to be built into any management routine. Supers must be removed and extracted in a short period.

With one to three colonies per acre (three to eight colonies/ha) the nectar sources are quickly harvested. Stocking density is so high that 1200 colonies can be within a square mile. Colonies sometimes go home lighter than they arrived.

Honey collected from canola is a light white <10 mm on the Pfund scale. It is in high demand in the U.S. Export markets to Europe were affected in the past by anti GM protestors but with the approval of GM crops for the EU, public perception of hybrid crops is changing.

Advantages

On the positive side canola pollination guarantees an income. Banks that loan money to beekeepers like to see a good cash flow. The stability provided by canola pollination contracts is an important factor in providing financing for the expansion of business.

The irrigation districts in southern Alberta are generally used for growing corn, beets and potatoes, none of which provide forage for honey bees. Canola provides an income from honey production and pollination in a normally low yield area.

A well organized pollination business is hard work, almost 24-7, for six months of the year. The reward at the end of the year, if all goes well, is a good income and an opportunity to take a Winter holiday.

Role For The Seed Companies

The seed companies have researchers engaged in producing newer high yield varieties with traits for a healthier human diet. We beekeepers must remind those in the lab that it is also important to maintain the physiological structure of flowers that is necessary for effective pollination. The flowers must be attractive to honey bees. This means maintaining a good pollen source in male flowers, good nectar source in female flowers, as well as petal size and attractiveness of the flowers.

This year in southern Alberta, Bayer CropScience is working co-operatively with Alberta Agriculture to collect samples from hives when they are checked for hive quality at pollination time. It is this kind of partnership that will provide a benefit to beekeepers as well as the seed industry.

There is awareness in seed companies of the need to improve pesticides without killing honey bees. We encourage them to pursue research into species specific insect repellents and hope that this will be the way of the future.

The Future

The seed companies have scientists performing ongoing research into a variety of different traits for canola.

One trait is high oleic acid, a monounsaturated fat that is good for cholesterol levels. The oil from this plant does not require hydrogenation (the process that turns oil into solid fat and produces nasty trans fats that are not good for you). Some varieties are bred for lower linoleic acid which is a less desirable acid.

Omega 3 is a healthy choice and there are now some canola varieties that have enhanced Omega 3 oil, which will please dieticians. Some varietals have been found that have low nitrogen requirements, which is a bonus for not having to use large quantities of fertilizer. In an age of reducing our carbon footprint, this genetic trait is valuable. Work is currently underway by industry to produce a seed that has genes for herbicide tolerance, insect resistance, is oil enhanced and low in nitrogen requirement. It is estimated that in 10 years time, 40% of the hybrid canola will have these new traits.

The future is bright for canola growers and for beekeepers supplying the necessary pollination services. Despite the hard work and the challenges, the rewards are worth the effort. BC

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Managed Pollinator CAP
Coordinated Agricultural Project

Pesticides Applied to Crops and Honey Bee Toxicity

Marion Ellis

Abstract

This article discusses the role that pesticides applied to crops may play in honey bee health. Although no one pesticide has been clearly associated with causing colony collapse disorder, there is evidence that the additive and synergistic effects of multiple pesticide exposures are harming bees. Pesticide use patterns have changed in the past decade, and this article reviews research on how crop pest control practices are affecting honey bee health. It then concludes with a discussion of the current risk assessment protocols to protect honey bees and how they are being amended to address current issues and concerns.

Pesticides applied to crops

The recent sequencing of the honey bee genome provides a possible explanation for the sensitivity of honey bees to pesticides; relative to other insect genomes, the honey bee genome is markedly deficient in the number of genes encoding detoxification enzymes (Claudianos et al., 2006). This notable difference renders honey bees more susceptible to pesticides than other insects, and beekeeping has been negatively impacted by pesticides applied to crops for as long as pesticides have been used.

Despite the dependence on honey bees for the pollination of crops in the U.S., colony numbers have declined by 45% over the past 60 years (NAS, 2007). Most honey bee losses from 1966-1979 were attributable to organochlorine, organophosphorus, carbamate, and pyrethroid pesticide exposure. Efforts to restrict pesticide application during bloom provided some relief; however, the residual activity of some pesticides was never effectively addressed. Colony losses were especially severe from 1981 to 2005 with a drop from 4.2 million to 2.4 million although some of the decrease is attributable to changes in how colony numbers were estimated. The introduction of parasitic honey bee mites, *Acarapis woodi* (1984) and *Varroa destructor* (1987), contributed to dramatic bee losses. At the same time, the control of crop pests in U.S. agriculture was rapidly changing. Genetically engineered (GE) crops were developed and extensively deployed, and two new classes of systemic pesticides, neonicotinoids and phenylpyrazoles, replaced many of the older pesticides. The rapid development and deployment of these two new insect control techniques distinguish U.S. agriculture from other regions of the world. In Europe a more cautious approach to the adoption of new agricultural practices has been taken.

GE plant varieties

GE plant varieties that have herbicide tolerance or insecticidal properties were first introduced into the U.S. in 1996. Soybeans and cotton are genetically engineered with herbicide-tolerant traits and have been the most widely and rapidly adopted GE crops in the U.S., followed by insect-resistant cotton and corn. In 2007 these GE crops were planted on more than 113 million hectares worldwide, and the United States leads the world in acres planted with GE crops with most of the plantings on large farms (Lemaux, 2008). Insect resistance is conferred by incorporating genes coding for insecticidal proteins produced by *Bacillus thuringensis* (Bt), a common soil bacterium. While Bt can also be delivered by spray application, GE plants benefit from continuous production of Bt toxins. Bt endotoxins are activated in the insect gut where they form pores that allow gut contents to leak out of the lumen leading to the death of the insect. To date, Bt genes have been incorporated into corn (*Zea mays*), cotton (*Gossypium hirsutum*), potato (*Solanum tuberosum*) and tomato (*Lycopersicon esculentum*), and GE seeds of these crops are available to producers. Precommercial field tests of 30 different plant species with Bt genes were conducted in 2008 including apples, cranberries, grapes, peanuts, poplar, rice, soybeans, sunflowers and walnuts (ISB, 2007).

Numerous studies have been conducted to determine the impact of GE crops on honey bees (Lemaux, 2008). Canadian scientists found no evidence that Bt sweet corn affected honey bee mortality. Studies conducted in France found that feeding Cry1ab protein in syrup did not affect honey bee colonies. Likewise, exposing honey bees colonies to food containing Cry3b at concentrations 1000 times that found in pollen resulted in no effect on larval or pupal weights. Feeding honey bees pollen from Cry1ab maize did not affect larval survival, gut flora, or hypopharyngeal gland development. A 2008 analysis of 25 independent studies concluded that the Bt proteins used in GE crops to control lepidopteran and coleopteran pests do not negatively impact the survival of larval or adult honey bees (Duan et al., 2008).

There is no evidence that the switch to Bt crops has injured honey ➢

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bee colonies. To the contrary, it has benefited beekeeping by reducing the frequency of pesticide applications on crops protected by Bt, especially corn and cotton. On the other hand, the switch to GE crops with herbicide resistance has eliminated many blooming plants from field borders and irrigation ditches as well as from the crop fields themselves. The reduction in floral diversity and abundance that has occurred due to the application of Round-UP® Herbicide (glyphosate) to GE crops with herbicide resistance is difficult to quantify. However, there is a growing body of evidence that poor nutrition is a factor in honey bee health. Eischen and Graham (2008) demonstrated that well-nourished honey bees are less susceptible to *Nosema ceranae* than poorly nourished bees. The adoption of agricultural practices that provide greater pollen diversity has been advocated, including the cultivation of small areas of other crops near monocultures or permitting weedy areas to grow along the edges of fields (Schmidt et al., 1995).

Neonicotinoid and phenylpyrazole pesticides

Another major shift in agriculture has been the development and extensive deployment of neonicotinoid and phenylpyrazole pesticides. These pesticides are extensively used in the U.S. on field, vegetable, turf, and ornamental crops, some of which are pollinated by bees. They can be applied as seed treatments, soil treatments and directly to plant foliage. Neonicotinoids cause persistent activation of cholinergic receptors which leads to hyperexcitation and death. One neonicotinoid, imidacloprid, was applied to 788,254 acres in California in 2005, making it the 6th most commonly used insecticide in a state that grows many bee-pollinated crops. The phenylpyrazoles, including fipronil, bind to ã-amino butyric acid (GABA)-gated chloride ion channels and block their activation by endogenous GABA, leading to hyperexcitation and death.

Neonicotinoid and phenylpyrazole insecticides differ from classic insecticides in that they become systemic in the plant, and can be detected in pollen and nectar throughout the blooming period. As a consequence, bees can experience chronic exposure to them over long periods of time. While some studies have shown no negative effects from seed-treated crops, acute mortality was the only response measured. Desneux and colleagues (2007) reviewed methods that could be used to more accurately assess the risk of neonicotinoid and phenylpyrazole insecticides including a test on honey bee larvae reared *in vitro*, test for larval effects, a proboscis extension response assay to access associative learning disruption, various behavioral effects, and chronic exposure toxicity beyond a single acute dose exposure. Pesticide exposure may also interact with pathogens to harm honey bee health. Honey bees that were both treated with imidacoprid and fed *Nosema* spp. spores suffered reduced longevity and reduced glucose oxidase activity (Alaux et al., 2010).

Registration procedures and risk assessment

In the U.S. risk assessment related to agrochemical use and registration follow specific guidelines mandated by the Federal Insecticide Fungicide and Rodenticide Act. Despite the importance of honey bees, the effect of pesticide exposure on colony health has not been systematically monitored, and the Environmental Protection Agency (EPA) does not require data on sublethal effects for pesticide registration.

For many years, the standard laboratory method for assessing pesticide risk was to determine the median lethal dose (LD_{50}) of the pest insect. In a second step, the effects of pesticides on beneficial arthropods were examined by running LD_{50} tests on the beneficial species to identify products with the lowest non target activity. In the U.S. this protocol remains the primary basis for risk assessment in pesticide registration. However, this approach to risk assessment only takes into account the survival of adult honey bees exposed to pesticides over a relatively short time frame. In Europe, when the standard procedures do not provide clear conclusions on the harmlessness of a pesticide, additional studies are recommended; however, no specific protocols are established. Acute toxicity tests on adult honey bees may be particularly ill-suited for the testing of systemic pesticides because of the frequency of exposure bees are likely to experience in field applications. Chronic feeding tests using whole colonies may provide a better way to quantify the effects of systemics.

Registration review is replacing the EPA's pesticide re-registration and tolerance reassessment programs. Unlike earlier review programs, registration review operates continuously, encompassing all registered pesticides. The registration review docket for imidacloprid opened in December 2008. To better ensure a "level playing field" for the neonicotinoid class as a whole and to best take advantage of new research as it becomes available, the EPA has moved the docket openings for the remaining neonicotinoids on the registration review schedule (acetamiprid, clothianidin, dinotefuran, thiacloprid, and thiamethoxam) to fiscal year 2012. The EPA's registration review document states that "some uncertainties have been identified since their initial registration regarding the potential environmental fate and effects of neonicotinoid pesticides, particularly as they relate to pollinators (EPA, 2009)." Studies conducted in Europe in the late 1990s have suggested that neonicotinoid residues can accumulate in pollen and nectar of treated plants and represent a potential risk to honey bees. Recently published data from studies conducted in Europe support concerns regarding the persistence of neonicotinoids. While the translocation of neonicotinoids into pollen and nectar of treated plants

has been demonstrated, the potential effect that levels of neonicotinoids found in pollen and nectar can have on bees remains less clear. Girolami and colleagues (2009) report high levels of neonicotinoids from coated seeds in leaf guttation water and high mortality in bees that consume it. While the frequency of guttation drop collection by bees under field conditions is not documented, the authors describe the prolonged availability of high concentrations of neonicotinoids in guttation water as "a threatening scenario that does not comply with an ecologically acceptable situation." The pending EPA review will consider the potential effects of the neonicotinoids on honey bees and other pollinating insects, evaluating both acute risk at the time of application and the longer-term exposure to translocated neonicotinoids (EPA, 2009).

The use of newer systemic pesticides, including the neonicotinoids (e.g. imidacloprid) and phenylpyrazoles (e.g. fipronil), has become prevalent in the U.S. As systemics, these pesticides are present in all plant tissues, including the nectar, pollen and other plant exudates. Honey bees' exposure to these compounds is very different from that of traditional pesticides, where acute toxicity was a primary concern. Instead, honey bees at all stages of development may be chronically exposed to sublethal doses of these compounds. The consequences of this new mode of exposure has not been extensively considered in regard to pesticide regulation in the U.S., although the EPA is currently reviewing the status of these compounds. Beekeepers should watch these deliberations closely. Restricting new compounds may result in a reversion to older chemistries that clearly harm bees. Beekeepers should weigh the evidence and the risks carefully before taking a position.

A detailed review of the literature on Pesticides and Honey Bee Toxicity by R. Johnson, M. Ellis, C. Mullin and M. Frazier can be found in the May 2010 Special Issue of *Apidologie* on Honey Bee Health. BC

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REMOVING BEES

Cindy Hodges

I didn't know what to expect the first time I came along on a bee removal with Cindy Bee. I wanted to photograph her in her element as she's well known for her beekeeping and bee removal skills, sort of a bee-whisperer, if you will. I knew she was starting early in the morning, and I suggested meeting her there since this might not be very interesting, although I didn't tell her that!

On a chilly March morning with temperatures in the 40s, I pulled into a high end subdivision on the outskirts of Atlanta and saw that Cindy was already there. She had unloaded several ladders, saws, sheets, a vacuum cleaner, and enough equipment for a camping trip. I could see that this wasn't going to be anything like my preconceived notions! Cindy had introduced herself to the homeowner and surveyed the possible colony entrances – no bees yet because of the temperatures – so we proceeded to carry buckets and trays of needed items to the upstairs master bedroom. She immediately walked over to the wall and put her ear to it as she ran her hand slowly along it. She got down on her hands and knees and put her ear to the floor. She then proceeded to pull up the carpet from that corner of the room to about the length of a piece of plywood. She put her head and hand to the floor. Slowly she ran her hand across the wood. "Come here" she said. "Put your hand right here. That's where the bees are." Sure enough it was warmer in that area of the floor, but I didn't hear anything – yet.

I was ready for action and was surprised at the methodical care that went into preparing the room for this work. We needed clean sheets to cover everything in the bedroom. The bed, lamps, chairs, and floor were all covered. How messy could this get? I was about to find out. The doors were all closed to keep any stray bees in, and the window closest to the work area was opened and the screen removed. Cindy's tools were in a specific order, not to me, but they were all within reach as she worked. One bag looked like a doctor's bag as if she was preparing to operate. Then . . . she brought out the sawz-all! I didn't think the bees would like this and I was reaching for my bee suit. "You don't need that yet. I'll let you know." Our quiet, clean, zen-like atmosphere immediately turned to a loud dusty construction sight. The grinding noise of cutting through wood and nails with the vibration of that saw was deafening. Sawdust was flying. It didn't last long, and she had been very precise; no joists were disturbed, but I now realized why the sheets were there.

As the saw was unplugged, I heard a low roar coming from the floor sounding like one of those back massagers with the controls. It was still relatively quiet though and the floor looked untouched except for the outline where it had been cut. Cindy told me that I could put on my suit if I wished. You bet I put my suit on! I added gloves too. I didn't know how much was under that floor, but I was now nervous. Cindy also put

on her veil, but no gloves. She asked if I was ready and then used a crow bar to pull up that section of subfloor intact. A large black cloud of honey bees came flying out and enveloped the room. To an innocent bystander, it appeared that we were being taken over by the largest bunch of bees ever! They weren't really going for us. They were confused and disturbed. Most of them went right back to their nest or they flew out the window.

The most beautiful and natural sections of comb that I'd ever seen were on the bottom of that piece of flooring. Over a dozen large "frameless" sections of comb fanned out gracefully between the joists. It was a true work of art. The colony had been thriving in their temperature-controlled, man-made environment. One joist over, there was wax moth damage and signs of a "kill" from the pesticide company that the owners had previously used. It was obvious that the bees had been sprayed from the outside and that only a small part of the colony had been destroyed. The girls simply moved over one joist and were doing well. Cindy estimated that this colony had about 30,000 bees and this was only early March.

The vacuum cleaner that we carried up there was especially designed to vacuum up the bees and gently swirl them into a bucket for later relocation. This was a "Huckleberry Finn" job! Once I started vacuuming those bees, I didn't want to stop. I was mesmerized as I gently sucked them into that bucket. I vacuumed bees off the window sill, bees out of the lamp shade, and bees off of the comb. I wanted to get every last one! The job was now going to stay noisy, because we needed to leave the vacuum running. This helped the bees stay cool while they were contained.

While I vacuumed, Cindy proceeded to carefully remove each large section of comb, using a steel bladed paint scraper. She had two large plastic storage tubs for the comb – one for brood and one for honey. She was looking for the queen as she removed each piece.

Those sheets on the floor were becoming more important! Some honey filled comb had pulled apart when the floor was opened, and as Cindy examined each comb section, honey would drip on her, on her tools, and on the sheets. The bedroom smelled like a honey house now, the air thick and sweet.

I won't go into all the details of the removal, but I will say that when she finished, you couldn't tell that she'd ever been there. The room was clean, the carpet was replaced perfectly, and the bee cavity had been filled with insulation. She'd sealed the outside entrance, and she had a van full of bees, both in the bucket and on the combs. The queen was caged and the customer was delighted. It was a satisfying day for all of us.

I've now been on several removals with Cindy and every one has been a little bit different, but all have been exciting. It was the beginning of a whole new world for me. The bees and their "in home" habitats have been fascinating. Cindy is absolutely amazing in her manner and ability to remove bees from bedroom floors, soffits, walls, ceilings, behind chimneys, and around bathroom pipes. Her demeanor and hypnotic style appease both the homeowners and the bees. Her knowledge and finesse with the removals has been enlightening. She talks to the "girls" while she's working, and you never know when she gets stung unless you watch closely, when she scrapes her hand with the hive tool to remove the stinger. At the end of each day, she has satisfied customers, and colonies to relocate.

Cindy Bee and Bill Owens, both professional bee removers have teamed up and written a book on The Art, The Science, The Carpentry and The Business of Removing Honey Bees from structures – floors, walls, ceilings, soffits, columns, chimneys and more. Plus, tools, insurance, and negotiations. Look for this one-of-a-kind how-to book to be published by Bee Culture magazine and The A.I. Root Company, later this Summer.

While helping her, I've learned that every bee removal is a little bit different. Some colonies have been so large that they required two buckets to hold them all. Other small colonies might have been sprayed by pesticide companies and survived or have wax moth infestations. Some bees were just plain meaner than others.

She might be 30 plus feet up a ladder for a job outside or she might just use her step ladder for a living room ceiling. Sometimes her head would disappear into the ceiling next to the comb. She'd be reaching for the top of the brood comb to cut it out whole with her knife. The ceiling jobs were the messiest. Gravity helped the honey cover her head and hands, one drip at a time, but she continued until the job was done to her satisfaction. Later she "rubber banded" the comb into frames for use when she relocated the bees. No plasticell for her!

I would have paid Cindy to let me "work" with her. Instead, she usually asked at the end of the day, if I'd like some bees. Did I have a place for some more? What a fantastic experience! BC

Cindy Hodges is busy helping remove bees, and taking photos of bee removal. She, and Cindy Bee live in the Atlanta area.

All The Buzzz in...

Hello Friends,

A great way to learn about something is to ask questions. Never be afraid to ask. It shows curiosity and courage.

Bee B. Queen

Send me your questions.

Bees are good because they make honey and honey is good for us.

Riley Mann, 6, AL

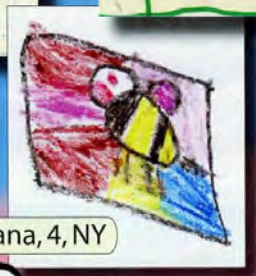
Bees are humming and birds are singing and that's what brings me the morning bells ringing. When I wake I feel so great that the bees are humming and the birds are singing and that's what brings me the morning bells ringing.

Riley Brunson, 9 WA

Dixie Coleman, MS

Hugh Spann, WI

Veronica Church, 6, OH



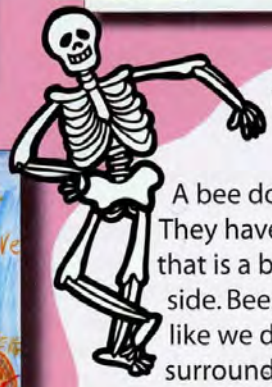
Jana, 4, NY

Carter Snider, 10, AL

Haley Zubrzycki, 6, MA

Inquiring Minds Want to Know

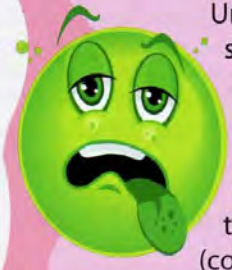
The students at Pennwood Elementary in West Chester , PA asked over 70 questions about bees. We didn't have room to answer all of them but here are a few.



Do bees have bones?

A bee does not have bones. They have an exoskeleton that is a bit on the crunchy side. Bees do not have veins like we do. Their organs are surrounded by a liquid called hemolymph that is a mix of blood and lymphatic fluid.

Do bees get sick?
Connor



Unfortunately bees do get sick. There are viruses, bacteria, and parasites that can affect the health of bees. Bees are having a harder time surviving due to something we call CCD (colony collapse disorder). We believe it is a combination of things including pesticides, malnutrition, and a virus.

Can humans "make" a honey bee produce wax?
Anjali

When worker bees are about 10 days old they begin producing wax from a gland in their abdomen. The gland uses the sugar in the honey to make the wax. Bees need about 6 pounds of honey to make 1 pound of wax. By making sure there is plenty of honey or sugar water in the hive, the beekeeper provides an environment for the bees to produce more wax.

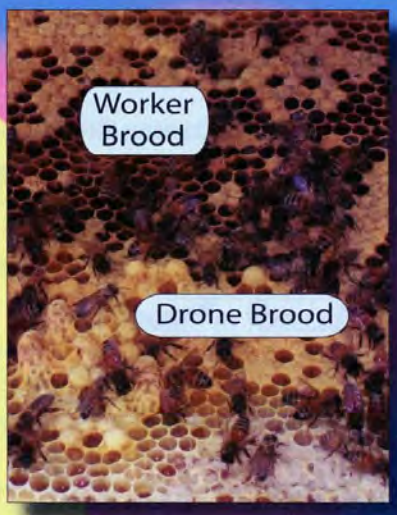
What do bees eat?
Brittany

The food that bees eat come from plants. They eat honey, made from nectar, and pollen .

Bee kid's corner

Produced by Kim Lehman -www.kim.lehman.com
www.beeculture.com
June 2010

Do only queen bees lay eggs?
Frankie



The queen is the only one who can lay fertilized eggs. Sometimes a worker bee will lay unfertilized eggs. A fertilized egg develops into a worker bee. An unfertilized egg develops into a drone. A hive cannot survive without worker bees.

Flying Flip Flops

Give your feet a lift by turning your flip-flops into bees. Take a pair of flip-flops and let your imagination soar.

Attach stuff using hot glue (with the help of an adult), string or wire. Some things to use: felt, pom poms, cotton balls, fabric, or ping pong balls. Think of ways to use recycled materials like, Styrofoam, plastic bags or packing peanuts.


Plastic cap with ribbon wings.


Chenille sticks with plastic flower pedal wings.


Beads with chenille sticks wings.

If bee brains are so tiny how do they memorize were to go to get the pollen?
Hayden, 6

The bees tell each other were to find the good flowers. By moving in what we call the bee dance, bees can tell each other how far to fly and in what direction to fly in using the sun as a guide. A bee brain has less than one million neurons. The human brain has from 10 billion to 100 billion neurons.

Pollination Power

June 22-28 is National Pollinator Week. Celebrate by telling a friend or neighbor about pollination. Start planning now for an event in your community next year. Find out about pollination events in your state. Go to www.pollinator.org

Bee Buddy, Milo Long-Frost, age 7, helps capture a swarm in Maine.

Are some bees cannibals?
Nick

The only time this may happen is if there is not enough pollen (food) in the hive. The bees will eat the eggs. It happens more often in the spring. It may be to control population or there may be other reasons we do not understand yet.

Beecome a Bee Buddy

Send two self addressed stamped envelopes and the following information to: Bee Buddies, PO Box 2743, Austin, TX 78768. We will send you a membership card, a prize and a birthday surprise!

Name: _____

Address: _____

City, State, Zip Code _____

Age: _____ Birthday: _____

E-mail (optional) _____

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

The JOY of DRONES

Larry Connor

My Farm neighbor Craig is learning queen rearing with me this year with the stated objective of producing mite-resistant, localized queens for local sale and use. Retired, and a small-scale beekeeper of 20 years, he still has a lot of enthusiasm over the project. When we are searching for a queen, he says to himself "that's a drone."

Few beekeepers acknowledge drones like this. In early April when drones are rare and just starting to appear in our colonies, it is a big deal. Come June it may be a bit tedious if he is mumbling "drone, drone, drone . . ." Perhaps he uses that as his mantra.

Depending on where you live in the Northern Hemisphere, drone populations rapidly increase and peak by May or June. There were drones in the colonies I've worked in Florida in January, but any drones in Michigan colonies in January have got quite a story to tell, and a colony that may be in transition, if not in trouble. Actually, it not unusual to find a few drones in perfectly healthy colonies in some hives in the Winter, but it seems like it goes against the normal organization and rules of the hive.

Vigorous, healthy colonies produce about five percent of the colony population in drones at the peak of the queen replacement (swarming and supercedure) season that comes with the rapid growth and development of colonies in your local area. Swarming season moves North as Spring moves North, stimulated by growing daylength and abundant food. By the Summer Equinox the key stimulation of increasing day length slowly reverses during the Summer, but the drone rearing will remain present until September to November (depending on latitude). A strong incoming food supply will prolong drone production. Or it may be done by early June if the pollen and nectar supply has already dried up. This happens in parts of Florida and Texas, as well as other areas of North America. There may be a second cycle of drone production in the late Summer and early Fall to coincide with local nectar flows, if they happen. When the incoming food is reduced or stopped, worker bees become selective about the number (and age) of the drones they keep, even if they are their brothers. The colony rules!

I used the title **Joys of Drones** for a reason. First, there is a remarkable benefit in accepting normal drone populations in a colony as a reflection of a healthy colony. Second, it is nice to see that virgin queens in the area will be well served by your healthy and well-fed drones. Drones are suitable to give to small children and grand-

This small corner of drone brood will not produce many drones. It should be used as a worker frame in the DHC.

This frame of worker brood has been reworked so some drones could be produced. It could provide both workers and drones for a DHC.

Joe Calme and a frame of Pierco drone comb. If it has larvae it is to early to put in a DHC.

This photo by C.J. Harvey shows a frame of naturally drawn drone comb. It can be added to a DHC with workers, worker brood and a caged virgin queen. If possible, more these DHCs to a different yard for good drone saturation.

motherly types who want to handle a bee. Really! They are often warm from the heat of the hive, and fuzzy to touch. You can practice marking bees by using the drones from one hive and watch how they spread to other colonies in the area. Who knew you could both play with drones and use them as a science experiment?

Drones have been used extensively by beekeepers as a means of Integrated Pest Management (IPM) against *Varroa* mites. Instead of using as much (or any) miticide to kill *Varroa*, a huge percentage of beekeepers use drone comb removal as a method of reducing the reproductive upswing of *Varroa* populations. *Varroa* mites have a relatively low rate of increase on worker brood, perhaps a 10 to 20% increase with each brood cycle, so it will take several brood cycles to double the *Varroa* mite population if there is no drone brood in the colony.

Instead of cursing the presence of drones, put them to work as part of your Varroa control program as well as a method of keeping lots of good drones in the air to mate with queens.

But add the drone brood (by adding the larger cells, or the bees building their own, which they will do in spite of your best efforts), and the *Varroa* mite population skyrockets. It is just a reflection of the longer developmental drones spend in the sealed brood stage, giving the mites several extra days to complete development. In one cycle of *Varroa* growth in a colony, entering the about-to-be-sealed drone larvae, there may be two to five times more mites coming out of the cells than went into them as foundress mites. Doing the math: it takes drones about 12 days in the sealed brood stage, that means that in 24 days there have been two cycles of mites come out of the emerging drone brood. No wonder *Varroa* mite populations can explode so quickly.

The IPM method mentioned above calls for the removal of the sealed drone brood and either freeze it (so the bees can suck out the juices from the dead brood), or scrape it into a bucket and feed the slurry to the chickens or bury it as fertilizer on the garden.

For a large percentage of small-scale beekeepers, the integration of the drone comb with screened bottom boards offers two chemical-free opportunities to reduce mite populations, and all you had to do is kill a few thousand drones to do it!

But that defeats the purpose of having drones in the colony, doesn't it? We NEED virgin drones to mate with virgin queens. Colonies go out of their way to REPLACE removed drones. We know that it required 12 to 20 drones to mate with each queen, and for every drone that successfully mates, there are probably five to ten that never mate, meaning that there must be a very large number of drones in the air to mate with a queen during any mating flight. If you use drone comb removal or destruction and reduce the number of suitors for area queens this suddenly takes on a sinister tone, since a successfully mated queen will carry the sperm from the 12 to 20 drones for her productive life, and will NOT mate again once she starts egg laying.

Pile up the drones in a mite-controlled way.

Since I have worked with queen rearing for a number of years and have started up a small operation this season, a simple management system can be used to provide healthy drones for mating as well as control mite populations in strong colonies. This is especially true if you use screened bottom boards and powdered sugar dustings.

In Michigan and other Northern locations, starting in late April or early May, remove frames of brood that contain large areas of sealed drone cells. If you find frames holding both workers and drone brood that is fine. If you added drone comb foundation (like the green plastic drone foundation) then the bees will draw out the comb and you will want to remove the comb only when the drone brood is largely sealed. This means that you will need to check your hives every 10 to 12 days to remove drone brood.

Rather than freezing or scraping out the drone brood, check for the queen and leave the worker bees, mostly nurse bees, and move the frame to a nucleus hive or full

eight or 10 frame hive body. Move a frame of worker brood too, picking one that has bees emerging from their cells. This will insure the success of the nucleus or colony when the drones finish development and emerge as adults.

Fill your nucleus or colony with more frames of drone brood and worker brood, making sure to check each frame for a queen or virgin. You will want to feed this colony, but drones may drown in a division board feeder, so use a jar feeder or some other system that keeps the drones from doing a backstroke. Drones need lots of protein from pollen or protein patties, so add a pound or so to a strong colony, and less for a nucleus.

You have now removed a huge percentage of the *Varroa* mites from the colonies that you harvest drones from, and protected them from a *Varroa* attack or a chemical treatment. Monitor the *Varroa* levels by using the powdered sugar dusting sampling method. This uses fine sugar, and the bees are not killed. Now, as the season progresses, continue to remove sealed worker frames and sealed drone cells on a regular basis. Make up new nucleus or full-sized colonies (do not combine the new drone brood with really old drones – or run the risk of loosing all the old drones).

These drone-filled colonies are called Drone Holding Colonies, and they are a great way to keep a viable population of drones flying to mate with neighborhood queens, as well as offering a method of controlling *Varroa* mites. Let's summarize what we need for a good DHC:

2 to four frames of mostly sealed drone brood (from several hives)

2 to four frames of sealed and emerging worker brood (from several hives)

Abundant nurse bees to care for the brood

Check that you do not have any of the queens in the holder colony

Add frames with pollen and honey to keep these bees alive

Feed with sugar syrup in a sealed feeder so drones cannot drown

Feed with pollen or protein patties

Place a caged virgin in the holding colony, making sure she cannot escape and mate.

How many drones are in this DHC? If you average areas of drone brood that are 75 square inches per side (that is an area 15 inches wide by 5 inches deep), four frames of drone brood could generate a holder with about 10,000 drones in one hive. That is three to 10 times the number of drones found in many Spring and Summer colonies.

The addition of the unmated queen is something I learned from Dr. Bud Cale Jr over 30 years ago, and as he explained it to me, we have created the conditions found in a colony where normal queen replacement is underway: There is an unmated queen, no laying queen, abundant drones in the brood frames and on the combs, and adequate worker bees, mostly young nurse bees, to keep the colony running.

Drone Holding Colonies can be moved to a site near (but not in) the mating yard, if you have one, or just put in the home apiary if that is all you can do. Reduce the entrance but provide the colony with ventilation holes. Since there may be some young drone brood, it will be about three weeks before all the drones emerge. At that time you can administer a powdered sugar dusting, using a sticky board to keep the mites from crawling back onto the hive. Every mite you capture is one more that will not be weakening your other colonies. Oh, the Joy of Drones!

Depending on the age of the drones you move, in four to six weeks most of the drones will be old or gone missing. At that time I would add a frame of emerging brood, replace the caged virgin queen with a laying queen, and set up the colony as a nucleus or a new increase colony. If you added the ratio of drone brood I suggested above, you should have lots of bees, and they will be in good shape since they have not had to raise much brood.

The use of DHC units is an excellent swarm prevention management tool, since brood and bee removal significantly reduces the chances the bees will develop swarming behavior. Think of it as making a split or nucleus during the earlier part of the season.

So, instead of cursing the presence of drones, put them to work as part of your *Varroa* mite control program as well as a method of keeping lots of good drones in the air to mate with queens. Even if you never raise queens, your colony or colonies will undergo routine queen replacement, so this is a great way to make sure that your boy bees are in the neighborhood doing their job. BC

Drones and Drone Holding Colonies are discussed in detail in Dr. Connor's book Bee Sex Essentials, available from Wicwas Press and many bee book dealers. You can order at ***www.wicwas.com****. That website also lists upcoming queen rearing courses being offered from Connecticut to Alberta, Canada.*

Honey Bee Packages

Last year - this year - and next year

James E. Tew

Life in the middle of a mixed blessing

Interest in keeping bees is higher than it has been in many years. Equipment sales are good. Bee books are selling well. Most beekeeping groups have experienced a 30-50% increase in membership and outside groups like gardeners and environmental groups have shown solid support for bees. Things could not be better – right? Sorry, but things could be better on a few other fronts.

True, we have many new beekeepers, but also true is that many of those new beekeepers are having a problem keeping their new colonies alive. Also true is that many experienced beekeepers are being challenged to keep their colonies alive, too. Beekeeping is in the middle of a mixed blessing – interest is high but so are bee mortality rates and replacement hive costs.

I don't know the "burn rate" for new beekeepers, but I am afraid it is a high number. We get a lot of new people but we seem to lose a lot of new people. I helped a new beekeeper get started a couple of years ago. Packages were put into new equipment and hives were placed on a partially wooded rural location. Everything looked great. For the past two seasons, his package bee starts have not survived the Winter. Four previous packages are dead with two new ones now installed. He's into this project for six packages – none yet overwintered. This new bee person is one of the persistent ones. I am afraid that most new beekeepers would have tossed in the bee towel by now. Last year, he bought packages. This season, he bought packages and next year, if the trend holds, he will once again buy packages. This is clearly frustrating but it may be our future.

My Packages - 2009

Though I buy a few packages every year, for the past four years, I have bought more packages than normal. It has become difficult to build colonies up strong enough to make splits and free swarms are much more uncommon. In years past, new beekeepers got started by: (1) buying established colonies, (2) buying nucleus colonies, (3) hiving a swarm or (4) buying a package[1]. Presently, buying packages is the primary way for a new beekeeper to start in the craft or for an established beekeeper to maintain colony numbers. Methods 1-3 above are becoming rare.

Just about a year ago, I bought 12 three-pound packages with a queen. I installed them by shaking the bees out but four days later I manually released the queens from their cages. I do this manual release procedure because bees can sometimes eat through the candy plug faster than I would like. If you don't already know, modern queens are difficult to keep in a new colony. New queen supercedures have been as high as 30% in some of my recent packages. Plus, there are now no free replacement queens as there were about a decade ago. Now jump ahead a year to 2010.

Overall, from my 2009 packages, I had a good – if not a strange – survival outcome. Ten of my packages survived. Of the two that died, one was not unexpected. I had used a good deal of the bees to make up an observation hive (which actually survived, too). So really, only one package died. By today's standards, that is not a bad average. So why is there a "strange" component to this discussion? While it is true that most of the 2009 packages did survive, they only survived as small clusters. On the small side, clusters were nearly as small as a baseball while on the large size most were larger than a softball. None were particularly impressive – but they survived. Who's to blame? Me? The package producer? The bees? All three of us? I truly don't know. In Ohio, we had some cold weather and we had snow-cover that was longer than anyone can remember. Does snow insulation help or hurt? If bees are healthy, snow cover should help.

I gave the package bees honey that previous bees had

A new queen cup that may or may not become a supercedure cell.

[1]For a very, very few new beekeepers, removing bees from a dwelling is a way to get started; however, this is a difficult technique for a new beekeeper to use.

Releasing queens underneath netting.

stored in deep frames. Was something wrong with that? Maybe it is something in my old combs. Maybe I should remove that old wax comb and install new foundation. To all of you who do that, please don't be offended, but that is simply not going to happen. Using traditional frame foundation, the labor requirement for me to perform that task on hundreds and hundreds of frames would put me so deeply under beekeeping water that I could not recover. If it is my comb that is causing part/all of my bee-build-up problems – and I know there is a chance that it is the problem – then I am in trouble.

For now, my 2010 colonies are sitting with my 2009 colonies. The flight activity from my new colonies is about three times that of my overwintered 2009 packages. But I am not complaining. At least the 2009 units are (somewhat) alive.

My packages – 2010

I beg not for mercy for I know that many of you keep far more colonies than I, but it is a good deal of hard work to get together 22 deeps of drawn combs and to find about 25 frames of capped honey. Tops, bottoms, inner covers and hive stands must be loaded also; all the while never missing an opportunity to check combs for signs of American foulbrood. I know that some of you use a slow release method for packages in which bees are not shaken but are put inside the colony with an empty shell on top. For me, that would involve gathering 22 empty deeps needed to implement this process and require temporarily dealing with the frames that must be removed to position the package cage inside the hive – plus the bees are sometimes reluctant to leave the cage. All in all, I don't use this procedure too often – unless the weather is really unfavorable.

The Weather

When installing packages, we all must watch the weather, even those of you in warm areas of the country. Extended rain or simply cool weather that traps bees on foundation can be a serious setback to the foundling colony. But the risks are even greater for beekeepers in cold climates. I had classic cool-climate Spring weather this past Spring. Day One was beautiful and nearly set high temperature records. It was a glorious day for installing packages. But all day, the weather forecasters were predicting a dramatic change in the early evening as winds arose and the temperature dropped – dramatically. I worked extra diligently to position one or two frames of honey in each package[2]. Day Two was an example of classic Ohio springtime weather. It was 80°F one day and 40°F the next. I had five packages still needing to be installed. I used the fast release method on the warm day but I used the slow release method on the second day. Though I stayed awake at night worrying about the newly installed bees and their caged queens, everything seemed to go okay – well almost everything.

The Annual Unanswerable Question

Every season, in every location a beekeeper somewhere must address the question, *"Is it better to hold them in the cage for a while or release the bees in somewhat marginal weather?"* I can't answer that question for any of you, but I tend to go with releasing them – especially if I have honey frames I can give them. My reasons for leaning toward releasing the bees rather than holding them in cages are selfish. I don't have to hear the confined bees buzzing. I don't have to watch the layer of dead bees as it accumulates on the cage bottom. I don't have to wonder if the feeder can is empty. I tend to release them and then worry that they are not okay in the hive – but at least I don't have to see or hear them.

Managing Package Queens

I am growing to think that we presently have a *"queen crisis"* as much – if not more – than we have a *"bee crisis."* I am not condemning package queens or suspecting production techniques, but seemingly for several years, the quality of package queens has not been great. Supersedure rates are high – at least in my package bees. In 2008, a year I am not really reviewing here, I had about 30% of my package queens be replaced during the first brood cycle. But I am hesitant to blame package queens because I have absolutely no observations on how many of my established colony queens were replaced during the same timeframe. I cannot conclusively say that package queens are the only problem.

Releasing Package Queens

The time-honored way to release caged queens is the candy plug method. One-third of a Benton three hole

[2] In several previous Bee Culture articles, I have made reference to my use of deep supers instead of shallower honey supers. That process actually worked resulting in me having a considerable amount of honey in deep frames that I could use to jump-start these packages. For the past three years, I have essentially made no usable honey crop opting to hold honey in these frames for future emergency feeding.

queen cage is filled with sugar fondant. The bees slowly eat through the candy plug thereby quietly releasing the queen. But this rate of release time varies from fast to slow – depending on the bees that are doing the eating. I release my queens directly. I want them to stay confined and protected within the bees for about four to five days. Also, I want to get that cage out and remove the accumulated burr comb.

Burr Comb

Burr comb construction is an issue in nearly any package/queen release program. In any empty space, bees want to build comb there first rather than use the frames we have given them[3]. On rare, rare occasions, the colony queen is unintentionally shaken with the package bees so the purchaser has two queens in the package – one caged and the other free-roaming. Releasing the caged queen into that colony will be sending her to certain death. Check the small pieces of burr comb that will be attached to the queen cage and on nearby frames. If a free-roaming queen is present, she will lay eggs there first.

Last year, I wrote about an errant queen that insisted on flying rather than placidly moving down onto the combs. It was a harrowing experience but later I found the cold, wet, forlorn queen on a blade of grass. I was able to save her and today, she is still reigning in her colony. Seeing a queen fly away is always a memorable beekeeping experience. This year, I made some changes.

Using Nylon Netting to Restrict Queen Flight

This year, I draped a piece of clumsy nylon netting over the hive in anticipation of *fly-happy* queens. Of the 22 queens I released, I had three fliers. I tugged the netting down over the frames and forced the panicked queen down into the frames. The crude system worked very well.

Though it works, this netting thing needs polishing. Though it did, indeed, prevent three queens from taking flight, it was not without hassles. (1) I now wear bifocals plus a bee veil. If the netting doubled on itself, I could not see through it. I had to flip my veil back when performing the release procedure in order to see what I was doing. (2) As I reported above, the weather was windily changing. It kept catching my netting and blowing it around. I truly needed four hands. (3) After removing the staple that held the screen wire closed, the rough wire edges would snag on the nylon netting causing me frustration and (4) the netting tended to become messy as it was dragged through honey and syrup. I feel a need to say again that though the piece of netting was an annoyance, it clearly kept three queens from flying away. Any ideas?

My Packages – 2011

At this moment, (1) I predict that I will purchase fewer packages next year. On a personal note, I felt my age this past year. I can't continue to ignore that inexorable fact. (2) If the 2009 packages, now one-year old colonies build up better and survive the upcoming Winter better, that will be yet another reason to reduce my package purchase. Plus, those colonies should be requeened this season. Honestly, I doubt that will happen. (3) But ultimately, what I do with packages in 2011 will be dependent on how well both the 2009 and 2010 packages develop and tolerate next Winter. It's a moving target.

Overall, I still like packages as a way to start and to stay in beekeeping. The price has gone up, but for all the specialized work involved, they are still a relative bargain. True, I complained about package queens, but not all were rejected. I tend to focus on the ones that didn't work – not the ones that did. Most colonies are successfully begun from packages. There are always the horror stories of bees flying away, but in general, installing a package is a tried/true standard procedure. Not all package experiences are perfect, but I still plan to buy them for the next few years. BC

[3]Package bees building in open spaces rather than using supplied combs or foundation is interesting beekeeping biology. Are they building the combs there because they are clustering around the caged queen or are they building combs there because our supplied equipment is a second choice for them? I don't know.

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684; ***Tew.1@osu.edu;*** ***http://beelab.osu.edu/***

"Recent changes in agriculture have brought the honey bee prominently to public attention. It is the only insect useful for pollination whose numbers can be controlled. The prosperity of the beekeeper thus becomes of vital public interest. Until recently little attention has been given to planting for bee pasture."[1]

Excerpts from 'Plants Useful for Bee Pasture', Frank C. Pellet, Economic Botany, 1947

Bee Friendly Farming

Kathy **Kellison**

My name is Kathy Kellison, and I'm the executive director of a shoestring nonprofit I founded three years ago called Partners for Sustainable Pollination (PFSP). PFSP is an organization dedicated to improving the health of honey bees in pollination services. We work with beekeepers, scientists, government agencies, growers and other land managers. We are primarily focused on identifying, increasing, and enhancing bee forage in the U.S., which is commonly understood to be a limiting factor on bee health and the beekeeping industry.

If someone had asked me three years ago what EQIP, WHIP, CRP, CSP, FSA, NRCS, or a dozen other alphabet soup acronyms stand for or what their purposes are, I would have been at a loss for an explanation. I now know they are all important parts of the infrastructure to help willing growers create habitat or critical forage for honey bees through government programs authorized in the Farm Bill and funded by Congress.

At the time of PFSP's very humble beginnings, there were two other established pollinator-advocacy organizations: NAPPC (North American Pollinator Protection Campaign) and Xerces (The Society for the Conservation of Invertebrates). Neither included in their missions devoting energy to honey bees. However, with the continued decline of honey bees and the unexplained phenomenon of CCD, now both organizations formally collaborate with beekeeping leadership.

The work of PFSP falls into one of four categories:

- Collaboration with scientists, growers, beekeepers, and other pollinator advocacy stakeholders to promote best management practices in agriculture to minimize harm to honey bees and other pollinators;
- Contribute recommendations on honey bee/pollinator issues to regulatory agencies including EPA, USDA/NRCS, APHIS, & CDFA;
- Provide outreach to growers by coordinating workshops to raise awareness about the challenges faced by pollinators – especially honey bees and beekeepers, and how land management options can affect pollinator health; and
- To foster consumer awareness and support for improving honey bee health through participation in the 'Bee Friendly Farming' initiative.

When I began this work, I knew almost nothing about politics, the beekeeping industry, or advocacy work, and not very much about bee biology either. I am deeply indebted to generous, experienced, and talented individuals like Randy Oliver, Gene Brandi, Eric Mussen, Robbin Thorp, and Marla Spivak, among many others, who have somehow made time in their jammed lives to mentor and advise me at every step of the way.

Much of my time initially was spent attending various conferences organized by ABF, AHPA, or NAPPC, so that the leaders in those organizations could get to know me. I first met Gene Brandi testifying in opposition to AB 771, the bee exclusion legislation proposed to satisfy the Seedless Mandarin Growers. I now proudly serve on the Board of Directors for California State Beekeepers Association.

The one glaring realization that has been a constant is the gross disparity between current government regulations and the challenges faced by bees (and beekeepers) meeting pollination demands. This led me to conclude that in order to improve bee health, what is needed is widespread education on these issues.

I often hear from beginning beekeepers "Yeah, my grandfather was a beekeeper," or "I remember my grandfather keeping bees," etc. Because of the relatively rapid transition peaking in the 50s and 60s from smaller family farms to larger and fewer farms,[2] the craft of beekeeping has greatly diminished. With the introduction of the Varroa mite, bee husbandry has become more difficult, and, for some, less appealing as a profession. Dennis vanEnglesdorp refers to 'Nature Disconnect Disorder' when addressing audiences on the topic of CCD, and this is exactly the point. In large measure, most citizens have lost connection with one of the simplest and most crucial of biological mechanisms – pollination. Just a generation or two ago, much of the knowledge now acquired in high school biology would have been learned growing up on a farm.

The CCD event has precipitated an unprecedented deluge of scientific inquiries into bee pathogens and chemical residues which have greatly increased our understanding of bee health issues. What we do know is that lack of good pollen forage in the bees' diet decreases their immunocompetence,[3] and makes them more susceptible to diseases, pests, and pesticide exposures.[4]

Beekeepers are dependent upon land that they do not own to pasture their bees. The reduced ratio of open land to developed land limits the number of colonies that

beekeepers can nurture. Awareness needs to be raised about the need to provide sufficient habitat to support the number of healthy colonies required to meet pollination requirements.

This all led to the recent creation of the Bee Friendly Farming™ (BFF) Program and the trademarking of the BFF logo. The program is open to citizens from all walks of life who want to help, including farmers, ranchers, school groups, local governments, and especially beekeepers to help raise public awareness about pollinator habitat needs and to encourage consumers and businesses to reward bee friendly growers and local beekeepers by purchasing farm products bearing the BFF logo.

The goals of BFF are:

- Enable consumers to support growers who are utilizing best-practice management for bees on their working lands by purchasing produce bearing the BFF logo;
- Augment cost-share assistance to growers with the fees collected from participants;
- Raise awareness about the challenges beekeepers face to meet the dietary needs for healthy bees through the networking of the BFF logo;
- Increase habitat for all bees and pollinators; and
- Educate growers and landowners to be aware of pollinators when applying pesticides.

Anyone wishing to help our honey bees and other pollinators can take the following actions:

- Thank BFF-certified growers by purchasing local produce and bearing the BFF logo;
- Become BFF-certified at **www.pfspbees.org/selfcert.htm** and use the BFF logo in your own efforts to spread the word; the form is also available at **www.BeeCulture.com**. Click on the BFF logo;
- Plant bee-beneficial forage plants on your farm, in your backyard garden and on school grounds, parks and other public lands;
- Be aware of pollinators when applying pesticides; and
- Invite beekeepers to place their hives on your land if you have safe bee forage.

Beekeepers can also help in two other important ways – by encouraging growers to participate in the BFF Program, and by becoming BFF-certified and displaying the BFF logo on their own websites. BC

Kathy Kellison is the coordinator of Bee Friendly Farming, and lives in northern California.

Sources:

[1]Plants Useful For Bee Pasture, Frank C. Pellett, Field Editor, American Bee Journal

[2]Toward a Sustainable Agriculture, Jon Hanson, John Hendrickson, 2009

[3]Diet effects on honeybee immunocompetence, Cedric Alaux, Francois Ducioz, Didier Crauser and Yves Le Conte, Biology Letters, 2010

[4]A historical review of managed honey bee populations in Europe and the United States and the factors that may affect them, Dennis vanEngelsdorp, Marina Doris Meixner, Journal of Invertebrate Pathology, 2009

Swarms!

Jennifer Berry

Keeping colonies from swarming is like forcing a dog to not like bacon, a cat to ignore tuna or a fish to breath out of water.

It's April in Georgia (even though you're reading this in June) and it's definitely one for the record books. If you experienced it, then you know what I am talking about. It was a magnificent time to be a southerner (that is, of course, if you're allergy free). The dogwoods, Bradford pears, azaleas, redbuds, yellowbells, peaches and a host of other blooming plants have never been more spectacular.

While those of you in the Northeast experienced warmer than average temperatures this past Winter, the south experienced a cooler, wetter one. The sun did not shine for weeks. Complaints started mounting and phrases like "all this rain" and "will it ever warm up" were part of most conversations. We Georgians quickly forgot about the years of drought this state had recently suffered.

Due to the cold, early blooming plants were delayed several weeks. Then temperatures shifted overnight from Winter to Summer averages. The first two weeks of April saw June like temperatures in the 80s and 90s (10 to 20 degrees above average). And it stopped raining.

Because of the sunny, hot days, early bloomers were bursting alongside the later varieties; hence everything bloomed at once. Usually we experience cycles of bloom that are spread out over months. But not this year. One day the landscape was brown and drizzly, then the next, color was leaping out everywhere. The bees were just as frantic as the plants and their populations exploded overnight. They had spent too many days crammed inside. So when the sun broke out so did the bees.

With all the bloom came daily, record breaking amounts of pollen and an early nectar flow that most beekeepers are still talking about. However, our world quickly took on a yellowish hue. Pollen found its way onto every surface, inside and out. Each morning before going to work folks had to run their wipers in order to dislodge all the pollen. Tops of hives, cars, driveways, sidewalks, roofs, birdbaths, decks, porches, leaves, grass, dressers, carpets, tables, cats, blankets, and computers were all yellow in color. In the morning pulling out of the driveway the tires would leave tracks. Plus, as one walked through the fields, explosions of pollen bombs would cover your boats and legs.

I felt for those with allergies. People walking around in a daze because they were so tanked up on anti-histamines: eyes red and puffy, swollen nose, looking absolutely miserable. Balls of crumpled Kleenex in their hand, sticking out of their pockets or scattered about on the floor. The nasally voice that keeps apologizing for sneezing for the 100th time.

With the tremendous onslaught of bloom something else kicked in as well. Swarms, swarms and more swarms. By the last week of March, first week of April, swarms were hitting the trees faster than we could count. One day while making splits, five out of the 32 colonies swarmed. The first coated a three-foot section of a branch, which was impossible to harvest. They quickly figured it was time to find a new place to hang out and away they went. The next three flew straight up from the hive into the trees lining the apiary. A bucket truck may have worked well toward retrieving them, maybe. But the final swarm was perfect. They landed at the end of a low hanging branch. The weight of the swarm brought them even closer to snatching height. They were shook into a nuc box and taken to a new site a few miles away.

Keeping colonies from swarming is like forcing a dog

to not like bacon, a cat to ignore tuna or a fish to breathe out of water. It's an integral part of the colony's nature: reproduction. And once they're in "swarm mode," I don't think there is anything you can do to prevent it. Over the years I have tried all sorts of different methods and have found one that works to some degree: creating an artificial swarm by splitting the colony. In the early Spring months, just prior to swarming (construction of queen cups), the old queen and several frames of bees and brood are placed into a nuc box and then transported to a different apiary. The remaining parent colony is given a queen cell, frames of foundation and a super if needed. The colony in the nuc box is still susceptible to swarming so they are given plenty of space by placing them into a 10-frame box and adding a super. Depending on the quality of the old queen, she may be replaced as well.

But, if you tried this or some other method and your colony still swarmed, not all is lost (that is of course if you can locate the swarm and it's within reach). In any case, I always keep a few five-frame nuc boxes in the back of the truck with four frames of foundation and one frame drawn comb. If a swarm comes available and it is accessible, take out three of the frames, bring the nuc box (entrance screened) as close to the swarm as feasibly possible, spritz the bees lightly with sugar water, and then shake, bounce, dump, brush, or jiggle the bees into the box closing the lid. If some of the bees don't make it into the box and they begin to re-form another cluster, more than likely you did not get the queen. Wait a few minutes for the cluster to form, then again bounce the bees into the same box. Close the lid and transport them to a different location. Once there, replace the two frames and feed them sugar syrup and a pollen patty. It will take the foragers a few days to locate nectar and pollen in the new area so it is a good idea to feed them.

If the bees are hanging on a smaller branch, cutting the branch just above the cluster and laying the swarm into the box works nicely as well. But swarms come in all different shapes and sizes and land in all different sorts of locations, positions and areas.

Now, what do we do with the old queen in the newly caught swarm? I like to keep queens longer than a year or two but my motivation may be different than yours. You may want to re-queen the new swarm.

So how do you know your colony has swarmed? Evidence that your colony has swarmed is a dramatic decrease in bees, no queen, numerous capped or nearly capped queen cells, little to no eggs, lots of capped brood, a disproportionate amount of drones to workers and cells in the brood area (which recently housed brood) are now being filled with nectar/pollen (if a flow is on).

But probably the best indication that your colony has swarmed is actually seeing the colony swarm. Suddenly thousands of bees erupt out of the entrance, pouring into the air, haphazardly taking flight. A cloud of bees encircles the area around the hive and a loud buzzing sound fills the air. Once the queen lands and she is located, the cloud migrates towards her and begins to form a cluster. Within minutes the cluster grows until all the bees have landed. It is an amazing thing to watch. If they are within reach grab a box quickly and retrieve them. It is not uncommon for a swarm to fly away to a different location.

While writing this article two colonies in our breeder yard swarmed. However, just two weeks prior they had already swarmed. These secondary swarms are called afterswarms and they are not uncommon. Depending on population, a single colony can issue four, maybe more afterswarms and each time they do, there goes another huge portion of your bee population (and honey production). Supposedly, the number of afterswarms is directly correlated to the amount of sealed brood. Just to let you know we were able to hive both of the afterswarms and one original swarm with our modified UGA bee lab bucket truck. The picture best describes how we save tax dollars around here.

Now what to do with the colony that was left behind? If you want, let the colony raise a queen. However, there is no guarantee you will have a laying queen at the end of the day. Plus, you are looking at weeks before she will begin to lay eggs and you run the risk of numerous afterswarms if cells are left behind.

Colonies **usually** swarm the day of or the day after the first queen cell is capped. Therefore, you have on average eight or nine days before the first virgin queen emerges. Then it takes her five to six days to become sexually mature. Next there are orientation flights, mating flights, a "resting period" and then finally she begins to lay eggs.

Before I could finish this article we had two more swarms. Maybe I should follow some of my own advice and get to beekeeping.

So the earliest your queen could be producing eggs is in 10 days, but it usually closer to 14 days. So 22-23 days after you colony has swarmed you now (maybe) have a laying queen. That is, of course, if she was able to find ample drones to mate with, navigate her way home, recognize her hive, not get eaten by a bird or a giant praying mantis, or hit by a plane, train or automobile.

Then you have another 21 days before the first worker bees emerge, and then another 25 days (mean age) before they take their first foraging trip. Adding the numbers, that's 69 days (on average) from the time your colony swarmed until you have a new flush of workers foraging. Now granted, there were numerous frames of capped and uncapped brood left behind but there is still a gap in brood production.

Here are some suggestions for the colony left behind. After the colony has swarmed, immediately cut out all the queen cells. Once virgin queens have hatched it is very difficult to a) find them and b) know for sure how many are running around in the colony. If there are numerous open queen cells I'd let nature take over because you really don't know how many virgin queens may have emerged and survived. Inserting a caged, mated queen into this scenario is a sure death sentence (for the mated queen). But if you catch them in time, cut out all the cells and insert a mated queen the next day or so. Then you're ahead of the game by several weeks. But a word of caution. Before you cut all the cells, make sure you can receive a mated queen within a reasonable amount of time.

Next remove a few frames of capped brood if the colony is well populated. Give the brood to a colony in need, such as a newly purchased nuc, a captured swarm or make a split. Reducing the amount of brood may help deter them from future afterswarms as well.

But if you do decide to let them raise their own queen this may help reduce the occurrence and number of afterswarms. Find two mature, nicely formed capped cells and leave them alone. Cut out all remaining queen cells capped or uncapped. These are the next generation of queens that could take part in afterswarms.

Before I could finish this article we had two more swarms. Maybe I should follow some of my own advice and get to beekeeping. Enjoy the Summer.

See ya! BC

Jennifer Berry is the Research Coordinator at the University of Georgia Bee Lab. Contact her at **Jennifer@BeeCulture.com**.

SMOKE

Gets In Your Eyes

Ann Harman

Murphy's Law of Smoke – whether from a beekeeping smoker or a campfire or anything else burning – states that no matter where you stand or sit smoke will blow in your face. Keep that in mind as we investigate the various things used to calm bees for hive inspections.

True, some people never use smoke. Depending on the time of year and the temperament of a particular colony it is possible to do hive inspections without smoke. However, if a colony is agitated for any reason – for example, their temperament, rough handling by beekeeper, inclement weather – then smoking the colony causes much less disruption to the bees' daily routines. If you have Africanized bees, smoke is your most important tool. Applying smoke to a colony is as old as man's association with bees.

Smokers themselves have changed size and shape over the centuries. Our modern design started with Bingham in 1877 and with modifications is the one used today. Fuel for a smoker, however, has always depended on availability of something that will smolder without instantly burning up. However, some smoker fuels work better than others and some can be dangerous to both bee and the beekeeper.

Loading and lighting a smoker, and keeping it lit is one of the challenges a beginning beekeeper faces. Two hundred years ago laying and lighting a fire was a necessary part of life. In cold climates a fire was needed to keep warm. And no matter where you lived, a fire was needed for cooking. Today we tell our children not to play with matches and are switching to elaborate gas grills instead of charcoal for our barbecues. So in a way we have lost touch with fuels and fire.

The chemistry of what is going on inside your smoker is complicated and fascinating. But this is not the place for details of combustion. Instead, just a review of a selection of common smoker fuels will give an idea of what is good, useful and safe, as well as what could be unsafe and why.

We must keep firmly in mind that many substances, when burned at the cool temperature of the smoker, do not produce simply carbon dioxide and water vapor but a vast array of other chemicals. Many of these should not be breathed either by the bees or the beekeeper. As recently as about 50 years ago adding ammonium nitrate to your smoker was recommended. Yes indeed it calmed the bees. It produced nitrous oxide that not only anesthetized the bees but also shortened their lives. In addition, hydrogen cyanide, a definitely lethal gas for bees and man, was produced. Unfortunately some of the products of smoker combustion either have little odor or a not unpleasant odor that might be masked by other odors.

At one time burlap was probably the most popular smoker fuel. It certainly is mentioned in beekeeping books, even ones written today. Well, burlap has gone the way of the dinosaur and very possibly a good thing too as far as our bees are concerned. At one time all sorts of things came in burlap: seed for crops and pastures, grain for livestock, just about anything loose or lumpy that had to be confined. The old burlap may have been treated with various substances to deter rodents from chewing through the bags, and possibly a fire retardant that would protect the storage facility if it caught fire. Burlap today can be found, but manufactured elsewhere. If you do find a source

To light a smoker •clean smoker •matches or lighter •dry paper •dry tinder (pine needles here) •dry, rotted wood.

Crumple the paper, light the **BOTTOM**, *let it flare, drop in smoker, pump three or four times to reflame it.*

Pump, pump, pump, and add tinder, firming it down with your hive tool, pump, pump, pump.

Add more tinder, pump, dry wood, pump, pump, pump, close and use.

all photos from *The Backyard Beekeeper*, by Kim Flottum

of modern bags, do you know what treatment it has had? No.

Old fashioned baling twine can still be found today, but it too is following burlap into oblivion. Baling twine is treated with rodent repellent. The farmer does not want to find open bales of hay spilling over the barn on a Winter's day. The twine is also treated with fire retardant. If, indeed, you have a source of baling twine it can be hung on a fence to let the rain wash it clean of the treatments. If you have been using it unwashed, do you know what effect it has had on your bees? No.

By the way plastic "burlap bags" and plastic baling twine are in use today. I trust that you have never tried using them in your smoker.

Another fuel frequently mentioned is cardboard in various forms: torn-up boxes, pieces of corrugated cardboard, and rolls of corrugated cardboard. This is one of the fuels that Dr. Frank Eischen of the Weslaco Bee Lab investigated as a smoker fuel. Some corrugated cardboard did not seem to cause any problems but other samples were lethal to bees. Now let us think for a minute. Corrugated cardboard is made in three layers – a sandwich of two flat layers with a rippled piece in between – all held together with some type of glue. Do we know what type of glue and what it can produce when burned? No. Also boxes you have obtained from other sources such as grocery stores may have been treated, perhaps inadvertently, with insecticide. Do we know the history of the cardboard box we just tore into pieces? No.

Cotton rags are another smoker fuel sometimes mentioned. One difficulty with cloth is that cotton is frequently mixed with synthetic fibers or is dyed. Both are unsuitable in cloth to be used as smoker fuel. Cotton cloth today is also processed to make it wrinkle resistant or have other properties suitable for clothing.

It can be difficult for us to assess the effect our choice of fuel has on the bees. We may inspect a colony today, close it up and not open it again for some weeks. If any problems occurred with the smoke we may well attribute them to other causes – poor queen, weather, crop spraying, and mites.

An interesting result was found with corncobs, cited in many books as suitable fuel. The field corn of today is not the same as 30 years ago. Bees smoked with only corncobs as smoker fuel died, not immediately, but three days later. Not every source of corncobs produced lethal smoke, but there is really no way to know which ones do or don't. The agent causing the death is not known at this time.

Tobacco, along with the usual fuel, has been tossed into smokers for many years. With the appearance of *Varroa*, and possibly tracheal mites, too, putting tobacco in the smoker became popular as a control for mites. Although it does kill mites it, unfortunately, is also detrimental to the bees. Do we know the best amount – to kill mites but do no harm to bees? No.

In case you think motor oil, particularly used motor oil, is just one substance – oil – think again. Motor oil does have an oil but also has a number of additives to give it the special properties our engines need. Used oil filters or rags soaked in used motor oil then burned in a smoker probably contribute quite a number of toxic gases puffed onto our bees. Motor oil, used or not, is one fuel that should never be used on our bees.

One fuel that seems to be used by some beekeepers is cedar chips, the bedding used for hamsters. If these cedar chips are made from the Incense Cedar, *Calocedrus decurrens*, be aware that the resins of this particular tree contain substances that are toxic in a number of ways, This tree is a native of the Pacific Northwest. The wood has been used for many years in a number of ways, notably for cedar chests (clothes-moth repellent) and for pencils. (The quantity of wood in pencils is of no concern.) The resins in the wood can be responsible for contact dermatitis, conjunctivitis and can cause retinal hemorrhaging. It also has certain antifungal properties and is not a desirable component of potting soils. Although I do not know what effects its use as smoker fuel has, I would hesitate to use it.

Pellet stoves have become popular. Compressed wood, usually hardwood sawdust, is sold for these stoves. Although a bit difficult to light the pellets seem to be a satisfactory fuel. Chunks of rotten or punky wood also make good smoker fuel once they are lit. Some of the woody shelf fungi serve as smoker fuel, again a bit hard to light.

In many areas of the country dry pine needles are popular. They are easy to light, pack well and do smell nice. Also they do not seem to cause any problems with the bees. The seed heads of sumac trees seem to have a somewhat narcotic effect on bees but no detrimental effect has been reported.

In some other countries smoker fuels also include dried banana and palm leaves. These litter the ground in the tropics. It is very convenient to be surrounded by smoker fuel that is lying at your feet. These leaves are easy to light and produce nice smoke. Dry cattle dung is also a popular fuel. I have found it hard to light and some of it really does not smell very nice. I do not know whether this fuel does any harm to the bees.

Smoke is not the only way we control our bees. Beekeepers load sprayer bottles with various liquids and spray the bees. Using a liquid spray does not cause the bees to gorge on honey; the liquid adhering to their bodies occupies them and you hope they ignore you. The bees feel compelled to clean themselves. Open brood should never be sprayed, even with plain water.

A mist of plain water on adult bees is effective, but can be short-lasting. Sugar syrup, a dilution of one part sugar to one part water or an even weaker solution, lightly misted on adult bees does give the beekeeper more time to inspect the hive since the bees will be occupied for more time than with plain water. However, if the bees are drenched or soaked with syrup it can clog the spiracles, or breathing openings on the sides of the thorax and abdomen. In times of dearth robbing of the misted colony by other colonies will be almost instantaneous. Bees will die.

Masking pheromones with the addition of a few drops of peppermint extract in a spray bottle of water can help in the introduction of a new queen. A misting of the colony will help to mask the new queen's pheromones thus giving the bees some time to get accustomed to her particular odor.

We hear much publicity about "secondhand smoke" with reference to cigarette smoke. Just remember that you are exposed to your smoker smoke as well as the bees. You need to be healthy and so do your bees. Choose your fuel wisely. BC

GLEANINGS

JUNE, 2010 • ALL THE NEWS THAT FITS

OBITUARY

John Corner, 1920 – 2010, died February 26 at the age of 90. He began working bees in the Kootenary region of BC as a youngster. He joined the Canadian Army in 1940 and served in the North Pacific, United Kingdom and the North-western Theatre of war including Germany. He is the holder of an "Order of British Empire" medal for gallantry. He was a member of the BC Dragoons and eventually retired as a major. He became Provincial Apiarist for British Columbia in 1950 and remained there until 1983, when he took early retirement.

During his tenure there he was instrumental in developing the Bee-Master's School, the Bee Industry Trust Fund, and the BC Bee Breeding program. All three remain strong support programs today.

After retirement he worked in Kenya, Uganda, Nicaragua, Peru and Bangladesh teaching beekeeping fundamentals. For his achievements he was the recipient of the Canadian Honey Council's Fred Rathje award and in 1999 he received the International Federation of Beekeeper's Award of Excellence.

John was a Charter member of the Canadian Association of Professional Apiculturists, the British Columbia Entomological Society, the Canadian Honey Council and the British Columbia Honey Producers Association.

He was preceded in death by his wife Dodie, and is survived by two daughters and a son.

HUNT ON FOR BEE PEST

The invasive species of Asian honey bees have been found at Innisfail in far north Queensland.

A single nest was found and Biosecurity Queensland officers are searching for more nests.

The bee is a potential carrier of the commercially devastating varroa mite and was first detected in Cairns in 2007.

Queensland Beekeepers Association president Trevor Weatherhead says there are concerns the bee could spread further south.

"If it got away in Cairns then eventually it will get away right down to New South Wales and Victoria and those places eventually so at this stage it's up to us, we've got to make sure we try and get on top of it if that's at all possible," he said.

Mr Weatherhead says so far 86 nests and swarms have been found at Cairns, Gordonvale, Yarrabah and the Atherton Tableland.

"We've actually doubled the number of surveillance staff that are out there and you would expect that once there's more people out there looking than you will find a lot more," he said.

"I think the increase in numbers that we are finding is a direct result of that increase in surveillance staff in the field."

Another invasive species has also spread in far north Queensland.

Electric ants have been found in the Cairns suburb of Redlynch, about five kilometres outside the nearest restricted area in Caravonica, north of Cairns.

Biosecurity Queensland has begun surveillance of the area.

LORENZO LANGSTROTH HISTORICAL MARKER

The Pennsylvania Historic and Museum Commission has approved an application to place a marker at the birthplace of L. L. Langstroth on 106 S. Front St. in Philadelphia. The Philadelphia Beekeepers Guild is sponsoring and raising funds for this marker. The PBG works to encourage and promote urban beekeeping through fellowship and education, and to raise awareness of the importance of bees to our environment. For more information and to find out how you can donate, please click on the following link: **http://www.phillybeekeepers.org/lorenzo-langstroth-historical-marker/**

Donations will be used exclusively to fund the production, installation and dedication of the historical marker. We estimate the minimum cost of this effort to be $3,500 and we will cap fundraising at $5,000.

All donors who do not wish to remain anonymous will be acknowledged on this web site. Individual donors of amounts over $200 and organizations donating over $500 who wish to be acknowledged will be recognized at the dedication ceremony on Sept. 10, 2010 and on this web site.

This effort has been most graciously endorsed by the Pennsylvania State Beekeepers Association by an initial gift/donation of $1000.00. We thank them most sincerely.

MITES, BEE THIEVES INVADE JAPAN

Japanese police believe a gang of thieves stealing to order are responsible for the disappearance of hives and the hundreds of thousands of bees they contain across Japan.

The theft have increased at a time when the honeybee population is falling, demand for honey is high and there's a ban on bee imports due to fears of an infection being brought into Japan.

Those fears were well-founded as the Japanese government reports honey bee tracheal mite, *Acarapis woodi*, has been discovered in Japan for the first time.

The Ministry of Agr says large number of honey bees have been reported dying in urban neighborhoods in the Tokyo metropolitan area since January.

The Yomiuri Shimbun newspaper reports the ministry believes the mite was brought into Japan in bees that were smuggled into the country.

The Japan Beekeeper and Honeybee Association says it is difficult to monitor the hives around the clock, but has told its 2,000 members to be on their guard.

"The latest case I heard of was 10 hives of 60,000 bees from Shizuoka Prefecture in a single night," Ginza Bee Project spokesman Akihito Tanaka tells London's Telegraph newspaper.

The Ginza Bee Project aims to put beehives on rooftop gardens.

He says another 10,000 disappeared from a strawberry farm in Tochigi Prefecture, where they were used to pollinate the plants.

"I first heard of such cases last year, but there seem to be a lot more robberies this year," Tanaka says.

He says thieves are apparently in on the rising price for hives and selling them on for a quick profit. They are almost certainly stealing to order, he says, as they would not know how to care for the insects over a long period. – *Alan Harman*

BEES FOR DEVELOPMENT

First Minister, Carwyn Jones, last week visited Bees for Development's Cameroon Honey Trade Project underway in partnership with the Welsh company Tropical Forest Products Ltd.

Bees for Development is an international development organisation based in Monmouth working to help African beekeepers trade their way out of poverty through selling honey and beeswax.

The Welsh Assembly Government Wales for Africa Grant Scheme is funding Bees for Development to work with Tropical Forest Products Ltd in this Project that aims to produce a Welsh-designed honeycomb separator that will assist Cameroonian beekeepers to improve the quality and yield of their honey and beeswax. Michael Tchana, the Director of the Cameroonian organisation Guiding Hope, visited Wales in March to work on the honeycomb separator, with the aim of increasing honey and beeswax exports to Wales in the forthcoming months.

The products will be sold through Tropical Forest Products Ltd., Wales' only registered Fairtrade importer. The Project outcomes will be shared widely with other beekeepers in Africa and Wales through the information network of Bees for Development.

With the UK producing less than one third of the honey we eat, honey trade presents a real economic opportunity for people in developing countries endowed with natural resources, but with limited financial capital. Bee diseases are highly prevalent in industrialised countries and most beeswax produced is contaminated with the chemical residues of bee medications. African beekeepers have a strong comparative advantage, as they are custodians of the largest remaining wild honeybee populations in the world, thriving free from introduced pests and diseases.

ENGLAND BEE LOSS DOUBLE THAT OF EUROPE

There has been a 54% decline in England in managed honey bee populations over the last 20 years, twice the rate of that in Europe, University of Reading researchers say.

Simon Potts of the university's School of Agriculture, Policy and Development, looked at data from 18 countries in Europe to quantify the extent of changes in honey bee colony numbers and beekeepers since 1965.

Working with Mike Brown and Gay Marris of the National Bee Unit at the Food and Environment Research Agency, Potts found there were different patterns across the countries, but Varroa mite infested virtually every honey bee colony.

In England the number of colonies fell from 182,000 in 1965 to 179,000 in 1985, and then to just 83,000 now.

Scotland had a 15% loss of colonies and Wales 23% in the last two decades.

The study recommends a standardization of evaluation methods across to Europe to draw up a more accurate picture.

"Harmonized reliable methods will be the obvious backbone for any research to understand and mitigate honey bee colony losses," Potts says.

Potts has been invited to speak at a Parliamentary seminar to discuss the implications of a decline in pollinators, such as the honey bee.

"Opportunities such as the Parliamentary seminar are ideal for alerting policy makers to the dangers to the bee population and the actions needed to overcome further losses of honey bees," he says.

Potts tells reporters he blames the increased use of pesticides, bee disease such as the Varroa mite and intensive agriculture for the loss of bees.

"This is far worse than we expected," he is quoted as saying. "The big worry is we have more calls for the UK to produce its own food but many fruits and vegetables rely on pollinators."

– *Alan Harman*

Display Advertisers

Wolf Girl

Ed Colby

My ski patrol buddy's girlfriend is the salad girl at one of the restaurants on Aspen Mountain. She dresses more like an heiress than a salad girl. She may be one. After all, this is Aspen. She's totally glamorous, but for some reason she took a shine to me.

She likes the nickname "Wolf Girl," but I also call her "Hollywood." If I swing by for lunch after the noon rush, she joins me at the employee table.

Wolf Girl is pretty New Age. No one would say that about me. She plans to start some kind of community organic garden this Summer in Carbondale and wants to include a "bee house." She invited me to be the bee house consultant. I told her I didn't know what a bee house was, and she said, "Well, you have to read the book."

She told me bees express "total love" in the hive. She got that from the book. I've got a couple of Rambo colonies that would break this little darling's heart. They have good work habits, but no love.

When she said she had a friend, at first I played coy. I said I was still on the rebound from my divorce. She said, "Well, she wants to meet you. She wants to learn about bee sting therapy. If you won't call her, I'll have her call you."

She brought up her friend every time I saw her. I wanted to get Wolf Girl off my back, and maybe I was a little intrigued.

The friend was expecting my call, and we hit it off, at first. She mentioned a number of times that she wanted some propolis.

When we finally went out on a date, she turned out to be as cute as a spotted dog with pups, and just the right age. But whenever I talked about my bees, she gave me this vacant look. When I gave her some propolis, she said, "What do I do with it?"

Later, Wolf Girl said, "You know why it didn't work out with you two."

"Tell me," I said. "I thought it was because she already had a boyfriend."

"It was because you made her pay for her dinner," she said.

"We split the bill," I said. "I'm sure she makes way more money than I do. What century do you think this is?"

I don't have time for women, anyway, especially in springtime. When March daffodils bloom by my kitchen door, overtime piles up on the mountain, and I get busy with the bees.

Last Spring I delivered a mean hive to one of my Grand Junction pollination customers. His orchard is inside the city limits. He got stung, along with the neighbor. He wasn't pleased.

So this year I wrote to him a month in advance. I said that if he wanted bees for his sweet cherries again this year, I'd be particularly careful to deliver him only my most gentle bees.

He never got back to me. Then, at the 11th hour, he called. He wondered how soon I could deliver. He made no mention of my letter.

I said I could bring bees on Thursday. On Wednesday, I selected some gentle, not too strong colonies and piggybacked them onto another Grand Junction pollination order. They were tied down on the pickup at 9 p.m., ready to be delivered in the morning, when he called. He said, "I won't need those bees after all. A guy who put bees here last Summer brought them back. Sorry."

For once I was speechless. Ten years of providing reliable pollination service, and he dumps me for the backyarder down the street? But I bit my tongue, because my famous temper only gets me into trouble.

My one-date girlfriend is a masseuse, and she knows about cancellations. She said, "You should send him a bill."

We had record cold temperatures this Winter, and the mercury dropped to minus 18°F in the Grand Junction area. Most of my growers got at least a partial crop this Spring, but at one peach orchard, the farmer lost every single flowering bud to mid-Winter cold. The trees are alive and sprouting leaves as I write this, but there will be no peaches.

There are persistent reliable rumors that bees pollinating around Palisade initially flourish, but then fail to build up as Summer progresses. This hasn't been my experience, but I'm wary.

A new customer and novice grower from Palisade called just prior to full bloom in her sweet cherry orchard. I delivered bees to her property on a Friday morning, full bloom occurred two days later on Sunday, and Sunday and Monday were warm and fair. Tuesday it got blustery and cool, and I told her I wanted to pick up my bees on Wednesday evening, just six pollinating days after I delivered them.

"But everything's still blooming," she protested.

"Look," I replied, "Thursday and Friday it's going to rain, so the bees won't work. When it clears on Saturday, it will also be the beginning of peach petal fall. Some of your neighbors may be spraying for mites and thrips. It won't be dormant oil. If there are dandelions on the orchard floor, my bees are in for it."

"But I'm organic," she protested.

"Doesn't matter," I said. "Bees have no respect for private property. They go where they will, and I have no idea where that might be."

She could have said, "Then give me my money back if you have to take them back," and I would have. But she didn't, and when I picked up the little darlings on Wednesday, her trees were still white with blossoms. I split a few flowers open, and every one had a tiny nascent cherry inside.

I was going to call her and explain, but I think I'll let her figure it out for herself.