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Jan 201

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Features . . . . . The Rest

This beautiful Winter bee-yard photo was taken by Marcelaine Wininger Lewis of Houghton, MI.

800.289.7668
Executive Publisher – John Root
Associate Publisher, Senior Editor – Kim Flottum, Kim@BeeCulture.com, Ext. 3214
Assistant Editor, Design Coordinator – Kathy Summers, Kathy@BeeCulture.com, Ext. 3215
Circulation, Advertising – Dawn Feagan, Dawn@BeeCulture.com, Ext. 3220
Publications Assistant – Amanda DeSimone, Ashaffer@RootCandles.com, Ext. 3255

Contributors
Clarence Collison • James E. Tew • Ann Harman • Kim Lehman
Phil Craft • Larry Connor • Connie Krochmal • Jessica Laurence
Toni Burnham • Jennifer Berry • Ross Conrad • Audrey Sheridan • Jeff Harris

The Label Is The Law

In response to the December Inner Cover – Try this!

All Blooms Honey
Product of U.S. Bees For Bees
Questions? Please contact . . .

Bees Housed At:

Bees & Blooms Apiary
Do Honey Road

Beesville, Beestate
Beezzzzzip

William Hultz
Defiance, OH

Five Bears In A Tree!

Our Lab, Marley, earns her keep by keeping bears away from the beehives. When I went to bed late last night I could hear her bark a bit as she routinely does, however on getting up this morning Matt and JD informed me that around 2:30 in the morning she set up a fuss and when JD went out, he discovered four bear cubs up a walnut tree in the front yard, and while he was standing there the mother bear came running across from the other side of the brook and joined the cubs in the tree. Here's the good part . . . they didn't call me because they didn't want to wake me up, so I snoozed through the whole thing! Darn!

PS . . . They initially thought there were five cubs, but the other cub turned out to be the neighbors growling, black cat . . .

John McDonald

The CAP Article

In your *Inner Cover* writing last month there was lamentation over the lack of answers to the current problems in beekeeping. In our world today with movies and television shows where vaccines are developed for horrible biological agents in a 1 or 2 hour period we cannot forget that in the real world things take time. Smallpox devastated mankind for many centuries. It is believed to have appeared around 10,000 BC at the time of the first agricultural settlements in East Africa. Egyptian mummies have evidence of skin lesions resembling those of small pox.

As time went on pieces of the puzzle began to come together, as of 430 BC survivors were called upon to tend to those afflicted because it was known that they would not catch it again. It was 1796 before Edward Jenner successfully inoculated James Phipps. His initial report to the Royal Society WAS REJECTED. I feel it premature to assert that the efforts of "Natural" is not on a large enough scale to MATTER.

If you read Langstroth – On the Hive and the Honey Bee, the wax moth was of major concern back then. Langstroth talks of how many people left the practice of beekeeping at that time due to the "ravages of the Bee Wolf". Today Wax Moths are primarily a problem of stored bee equipment and hives so feeble and small that it is no wonder they are overrun. I don't believe any pesticides or any of the multitudes of hive contrivances made by man

overcame the Bee Wolf, the bees did. Over the last 150 years the surviving stock has gotten to a point where moths aren't the same scourge they once were.

Will varroa, tracheal mites, SHB, and CCD run the same course? Who knows, but there are people working on it. They may not be backed by multinational corporations, but there are beekeepers all across this country and undoubtedly in other nations using no treatments and experiencing success, though be it on a small scale. The Wal-Mart mentality may not save us this time. In the very same issue that your CAP assessment was released another article Father Time Tested Mother Nature Approved (page 50) was an account of some beekeepers searching for answers.

What if we are asking a service from bees that they cannot successfully provide when we ask them to adapt to a world of mono-crop agriculture built upon OUR wants and needs while totally neglecting bees and their biology. To find the solution to our problems we must

look at the entire situation and first determine if we are the source of these problems. Do we have too much invested in this form of food production that we cannot evaluate alternatives? I have been lost before. I didn't want to turn around and admit I had made an error, but continuing in the wrong direction only leads to more wasted time and being more lost. What if we are at that point with our current food production paradigm.

When I write certain blog articles I sometimes intentionally will write in a way to get a RISE from my readers to generate dialogue. I hope that is what Mr. Flottum was up to, because I refuse to believe the sky is falling. When the going gets rough, the tough get going, that goes for bees and beekeepers alike. To me these bee problems are an indication that something is wrong. Bees are communicating with us much in the same way tomatoes tell me the soil lacks calcium when they develop blossom end rot.

Almost 12,000 years was a long time coming for a cure for Small Pox. I believe an answer can be found for our current bee problems in less time.

What if the current model along with many of the beekeepers practices are flawed? If it is not compatible with bee biology to truck them across the country for mono-crop pollination we must be able to admit that we took a wrong turn and come up with solutions to get back on track. I applaud the Rocky Mountain Survivor Queens group and all of the other small scale operations attempting to deal with these problems on their own, without large financial backers. Small scale solutions have the potential to have an impact that is unimaginably large. Thank you Mr. Flottum for getting me fired up enough to submit this e-mail. It is a first. I hope that a multitude of small scale solution seekers are equally inspired.

Jason Burns

Mosquitoes & Neonics

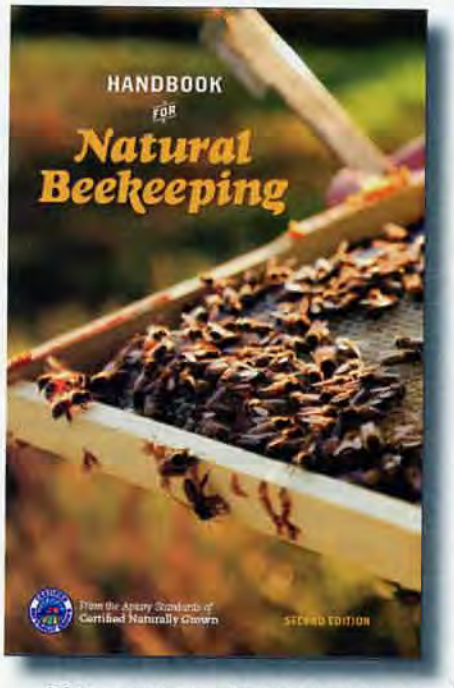
Hi, just read your editorial in the Dec issue and you are right on. What we too are experiencing with our bees is unsustainable. Have already had two recent Winters with 80% die off. And if there is a normal winter here in the thumb of MI we are headed for our biggest winter kill ever as so many of the colonies are only about three or four frames of bees. And the Summer queenlessness this year was off the chart mind bending!!

Anyway, us locals here have commented that every year there are fewer mosquitoes to deal with. Though no one misses them, are they a casualty of the neonics too since they live on plant nectar? I have not run across any mention of neonics and mosquito losses. And there are fewer frogs in the swamp in back of our farm. When Spring would come one could hear them over a half mile away. But now it is quite something less. Lack of mosquitoes or neonic run-off?? Haven't a clue.

Yes, something very big has changed and I think it comes from the neonic arena too. The bees just don't act right. Reminds me of alzheimer's disease – a healthy body coupled with a compromised mind.

Dave K.

New For 2013



This newly-updated booklet is published by Certified Naturally Grown for beekeepers who want to manage their hives naturally and support the optimum health of their honey bees without synthetic treatments. *The Handbook* covers all aspects of beekeeping - from apiary location to foundation to management of pests and diseases - in 40 colorful pages (5.5" x 8.5"). Organized clearly by topic, the contents are based on the Apiary Standards of Certified Naturally Grown and include the list of allowed and prohibited substances for CNG beekeeping, as well as definitions and techniques.

Take a look inside and order online at **www.naturallygrown.org/store**, or send a check to CNG, 540 President St, Third Floor, Brooklyn, NY 11215. $6 each plus $3 shipping.

Agralogix, LLC (**www.agralogix.com**) is pleased to announce the release of the 4 oz. Muth Jar under the RetroPak™ name. The 4 oz. Muth is a reproduction of a 19th century container, developed by Charles F. Muth of Cincinnati, Ohio for liquid honey. It was one of the first jars made in America exclusively for liquid honey, which was popularized after the recent invention of the honey extractor.

This container is great for marketing your varietal honey, sold as gifts, for wedding showers and so much more!

MSRP is $29.95 for a case of 32 with corks.

At time of publication, Blue Sky Bee Supply (**www.blueskybeesupply.com**) is stocking the item, as well as **www.muthjars.com** for retail sale. You may contact Agralogix directly for full pallet sales.

Understanding Bee Anatomy: A full color guide. By Ian Stell. Published by The Catford Press. ISBN 978-0-9574228-0-3. 201 pages, 6.5" x 9.5", Color throughout.

It's about time. There hasn't been a decent honey bee anatomy book out in a dozen years, and that one, Form and Function, by Lesley Goodman, was less an anatomy book than a physiology book. This is the best there is since Dade and Snodgrass, put out more than 75 years ago.

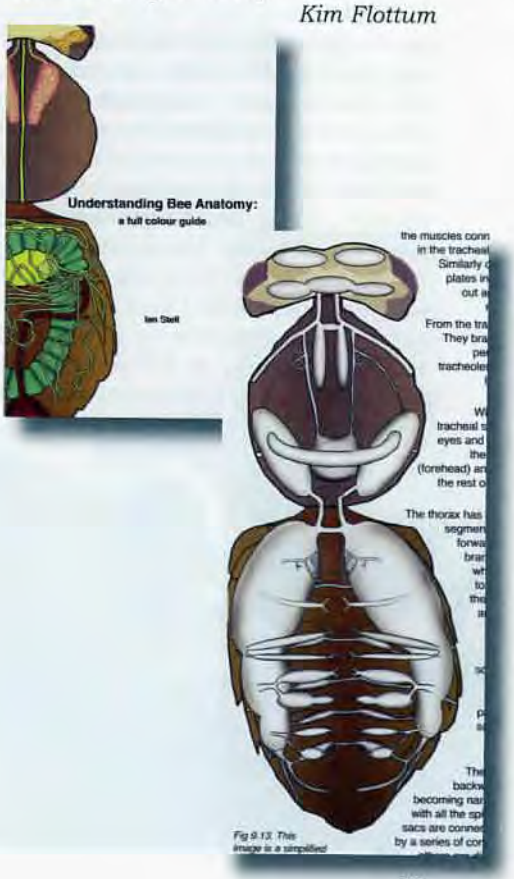
It's SEM, line art, paintings, photos, microphotos and regular photos. It's wonderful. It must be on your shelf.

Chapters include development, the cuticle, head and neck, thorax, abdomen, legs, wings, the circulatory, respiratory and digestive systems, plus the queen, drone and additional reading.

The first line says...There is a lot to a Bee. Believe me, there is a lot to this book.

It's pretty easy to get in the UK, less so here, but try Northern Bee Books on the web as they carry it. Or pester a local bookstore with the ISBN number. It's worth all the effort, and all the money, and all the time reading it. Really.

Kim Flottum



INNER COVER

Bed rest. Three, maybe four weeks. No dancing, jogging, sit-ups or anything at all without wearing a brace designed by a sadistic committee of medieval torturers that is composed of plastic, bungie cords, Velcro, small elastic stretchy pulleys, and blunt made-by-the-devil devices on the edges where it is the tightest, designed to puncture every vital organ imaginable, which, mind you, comes complete with no instructions or indications of top, bottom left or right.

My lower back has a multi-stitch scar almost a foot long that when first cut exposed six or seven vertebrae – a couple above where the work was to be done and a couple below where the work was to be done – elbow room, said the very nice but stern attending nurse.

Not to overdue it, but the past few years haven't been all that comfortable. First there was this broken leg that I didn't know was broken – a slip on the stairs jammed my foot against the wall and hurt like heck, almost immediately turning spectacular shades of black, blue, green and blacker, but the x-ray showed nothing serious – it'll get better, tough it out, don't be a whiner – said the doctors, radiologists and experts. You're getting old(er) so things take a bit longer. So I walked on that broken leg for six weeks – doing bee work, traveling here and there, teaching a six week beginner's class –shoveling snow, driving . . . everyday stuff, every day. After six or seven weeks of limping, shuffling, and really, really being bad company, Kathy wrestled me to the doctor again and we got a second opinion – a word of advice, don't wait six weeks – and the ordered MRI showed what you already know...Son, that leg's broken, here, here and here, said the doctor half my age. So wear this really expensive, partially insurance covered, non-refundable plastic boot, composed of bungie cords, Velcro, stretch pulleys and pinchy things made-by-the-devil that made life miserable for every muscle and bone and step from mid-calf to big toe. For six more weeks, oh, and use the cane, too...all the time, every step. Always. And though it did get me priority seating, first in line loading, fast inspections and a free drink on the plane I took to the ABF meeting that year it wasn't worth it.

So this back thing started about three years ago or so. One minute it was just fine, I rolled over in bed and the world ended. Immediately, without warning, sympathy or negotiation. The technical explanation is that the openings in three of the vertebrae had been slowly growing smaller, and one finally reached the point where it was pinching the nerve that ran from my lower spine down my buttocks, around the front of my thigh and ending just above the knee. My family doctor ... a nice guy who keeps bees...and the one who said my leg wasn't broken...and my insurance company...all said...Physical Therapy will cure it, for sure. So for a year I did the PT thing, got to know the guy there pretty well, found out he's in the top 2 or 300 or so of the NY Marathon every year, all the while the other two openings were getting smaller and smaller and smaller. After a couple years of this I had enough, got another MRI and the nice surgeon, who is half my age, said son, you need to have those fixed 'cause they ain't going to get any better. Or do you want to sit in a soft chair the rest of your life... which at the time was quite comfortable and an option I was seriously considering. But a tad unrealistic. Schedule the surgery, I said. OK, he said. As soon as possible.

Pre-admin tests by the dozen, gallons of blood work, interviews, tests, more tests, insurance forms by the mile, a date, a time, a commitment. D Day.

Early AM, nurses, more bloodwork, discussions with anesthesiologists, then the surgeon, then somebody else, then that trip down the hallway, looking up at the lights, just like TV, into the operating room...this one was round, interestingly, had a TV the size of a football field, and very nice person saying I'm going to admin.....

Recovering.
John Hardeman.

And some time later waking up with several people standing over me asking how I felt, was I thirsty, could I move my legs and what was my name and birthdate – for the record, Peter Flottum, 8/19/1947. I probably repeated that date 100 times the next three days. That's OK, they kept getting things right...and that's important when they are giving you all manner of drugs, several times a day.

Then home for...now going on four weeks. Still dealing with the brace, can't drive, bend, lift or twist, but am gradually noticing the difference. The cut itself is less irritating than at first, and the pinched nerves are not nearly as noticeable as a month ago. I'm sleeping, and any sleeping is sleeping better than I was sleeping before, so that's good. But all that sleeping has cut into my eating, so I've dropped something like 40 pounds...every one of them not needed by the way. Not that Kathy didn't try to fix that. I'm glad I didn't have to pay for the expert care I'm getting. Good food, timely medications, warm blankets...if you have to feel bad, this has been as good as it can get let me tell you.

But there were three weeks where I wasn't much use to anybody for much of anything. I'd tried to get ahead of the curve with the magazine before all this – we had most of it done before the cut was made.... but some of the thousand other decisions we routinely make as a team every month didn't get made, so things are a bit slow...and I hate it when I can't blame the post office for that. So all this to say if you didn't get this issue when you thought you should blame me, a doctor half my age, and a scarred and tender back, twice as old as it should be.

•

Somewhere on the pages of every issue of this magazine for more than 25 years there's an advertisement for Hardeman Apiaries. Sometimes it's a whole page telling prices and sizes of packages of bees, kinds of queens and all about shipping and delivery. They aren't fancy ads, but then they don't need to be. They simply sell bees, and the ads tell how to buy them. And sometimes they just send a wish for a safe and happy holiday. But they are always there.

Four generations of the Hardeman family with John in the center. (from Hometown Living Magazine)

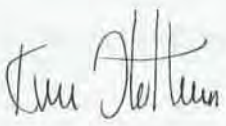
John Hardeman started with bees more than 60 years ago when he was twelve and looking for a job to help out the family. He found one working bees that Summer and he never looked back. He got married when he was 17 and over the years three boys and three girls came along. John's wife died young, and raising children wasn't going to be a government job, so John and family worked together on that and after working bees for someone else for almost 30 years he and his family started their own business. Working hard for what you need isn't a tradition in the Hardeman family, it's a way of life, and each of John's children have lived that life. They learned responsibility starting young. If you want something you work hard, if you want more, you work harder.

Starting with four hives, Hardeman's have over 10,000 now, mostly Italian but more and more Russians are showing up, and his 20 or so employees, including family – children and now grandchildren, raise queens, make packages, do pollination work and simply take care of bees and make honey. They manage to sell something like 40,000+ packages a year, from California to New York and off shore, too.

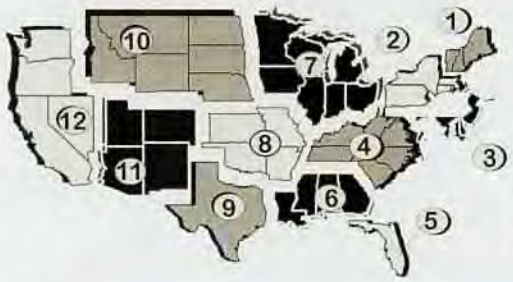
In a local magazine published recently, John was quoted as saying, "I made a living with bees, raised a family, helped with raising my grandchildren and now my greatgrand young'uns with the work here. Anytime any of them wanted a job, they could have it. They knew that didn't mean they could go down there and sit down. They work hard when they come.

"That lesson-of learning to give all you've got to whatever you do-is one of the most important, yet neglected, responsibilities among parents today," said John.

John Hardeman passed this Summer, but he leaves a family, a business and a legacy few have achieved in this industry.



JANUARY – REGIONAL HONEY PRICE REPORT



Five years running now we've surveyed our reporters to find out what practices they employ to keep they bees healthy and strong and well fed. No real surprises, but some good trends developing – feeding stimulant use is increasing it seems, but so is the use of registered chemicals, including essential oils – they must be helping, or folks are paying more attention. Either way, bees must be responding. Small cell continues to lose advocates, but screened bottom boards aren't quite as popular as they once were – but almost. Interestingly, use of the only registered treatment for Nosema, Fumigillan, isn't soaring – I would have thought use would increase, but apparently not. Too, use of HFCS continues its slow decline, but the use of sucrose isn't rushing to replace it. Even after this disagreeable weather year in most places, with a honey crop in the toilet, feeding isn't a major factor in management. Perhaps we'll see what comes of this in the Spring, when we measure overwintering success.

Percent Using . . .	Every Year Needed Or Not					Never Have, Never Will					Only If Needed							
Medication	08	09	10	11	12	13	08	09	10	11	12	13	08	09	10	11	12	13
Nosema - Fumigillan	17	34	32	39	34	21	14	13	13	10	14	8	54	52	54	51	52	40
AFB Treatment	45	31	37	20	37	18	14	14	11	9	15	8	42	56	52	70	51	47
EFB Treatment	34	26	34	19	33	15	14	12	18	20	20	8	45	62	48	61	56	44
Feeding																		
Sucrose	24	37	42	29	20	21	11	12	14	20	39	6	35	51	43	51	41	30
HFCS	20	18	28	15	12	9	24	46	44	51	56	25	18	36	28	23	34	18
Blend	8	15	17	9	8	4	24	59	58	60	68	30	15	27	24	31	38	9
Other - Honey, Fondant, etc.	8	18	19	23	17	11	17	44	34	26	21	9	20	38	47	51	53	33
Adding Feeding Stimulant	–	–	27	22	31	13	–	–	38	38	33	16	–	–	34	41	35	22
Feeding Protein																		
Commercial Substitutes	15	27	48	47	44	26	60	40	22	20	21	17	25	35	30	33	36	21
Pollen/Homemade	–	18	18	12	7	9	–	61	44	50	63	21	–	21	38	38	30	14
IPM																		
Oganic Acids, *Varroa*	18	23	23	23	20	15	42	44	40	45	47	20	38	33	37	32	33	19
Registered Chem. Treatments	57	37	6	8	18	17	14	14	34	32	41	19	32	49	28	59	41	19
Powdered Sugar	41	28	29	19	22	14	34	46	33	40	39	20	25	26	37	42	39	15
Drone Comb Removal	31	22	17	23	15	11	38	43	30	33	37	14	31	34	52	45	46	20
Essential Oil Treatments	–	22	29	20	26	13	–	43	27	23	30	21	–	27	51	37	44	23
Small Cell	–	–	2	3	2	5	–	–	67	73	78	29	–	–	31	24	22	10
Old Comb Removal	34	40	57	43	42	30	–	17	4	9	7	7	66	42	39	49	52	20
Screened Bottom Boards	–	50	42	42	43	30	–	30	27	31	39	11	–	26	27	27	17	11
Small Hive Beetle Traps	–	–	13	3	15	17	–	–	44	47	46	16	–	–	42	50	38	18

REPORTING REGIONS

	1	2	3	4	5	6	7	8	9	10	11	12	SUMMARY Range	SUMMARY Avg.	History Last Month	History Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.95	2.10	1.95	1.73	1.95	2.00	2.07	2.00	1.80	2.05	1.87	2.10	1.54-2.35	1.95	1.89	1.74
55 Gal. Drum, Ambr	1.80	2.03	1.90	1.71	1.73	1.78	1.98	2.00	1.60	1.95	1.72	1.84	1.45-2.10	1.82	1.80	1.67
60# Light (retail)	168.33	190.00	148.33	145.12	160.00	165.00	172.33	152.50	164.51	162.00	130.00	203.75	87.60-240.00	165.22	165.64	147.96
60# Amber (retail)	182.50	165.00	162.50	151.90	160.00	165.00	168.25	141.67	137.50	158.40	120.00	190.00	86.40-225.00	161.11	156.91	143.45
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	71.56	60.03	48.00	65.15	44.00	60.00	50.42	79.51	79.51	49.20	75.84	81.87	39.60-144.00	67.22	66.89	63.57
1# 24/case	113.01	90.03	108.00	83.65	90.00	114.00	86.00	96.60	72.00	124.40	105.92	116.27	72.00-156.00	103.25	105.10	92.44
2# 12/case	96.97	78.21	78.00	74.00	84.00	90.00	84.61	96.00	66.50	91.92	112.50	95.76	63.00-144.00	89.74	90.03	80.81
12.oz. Plas. 24/cs	99.04	75.80	63.10	73.50	72.00	68.33	66.60	85.80	66.00	69.60	85.20	82.48	25.00-115.20	76.31	80.39	75.43
5# 6/case	124.65	94.66	93.00	83.43	105.00	104.81	88.18	109.50	90.00	95.40	112.00	104.33	72.00-150.00	98.62	98.44	89.41
Quarts 12/case	141.00	128.88	112.17	113.80	102.00	100.67	113.55	105.00	105.00	141.68	110.20	133.50	52.00-166.00	115.35	120.77	118.50
Pints 12/case	74.00	70.95	96.00	78.20	72.00	62.83	77.20	60.00	78.23	71.00	73.20	80.00	48.00-115.00	74.96	75.95	74.38
RETAIL SHELF PRICES																
1/2#	4.42	4.05	3.30	3.67	3.97	3.50	3.17	2.99	3.97	2.61	3.75	5.00	1.96-6.50	3.72	3.80	3.35
12 oz. Plastic	5.19	4.66	3.97	4.05	5.25	4.50	3.97	3.98	5.00	4.05	5.05	5.33	2.99-7.50	4.50	4.64	4.24
1# Glass/Plastic	6.25	5.64	6.27	5.28	6.25	6.00	4.82	6.17	6.00	5.53	6.00	7.89	3.00-9.79	5.87	5.97	5.51
2# Glass/Plastic	10.50	9.60	11.44	8.44	9.95	9.33	8.80	9.66	8.00	9.57	10.20	13.33	6.00-15.00	9.85	9.66	9.25
Pint	7.75	7.48	8.77	7.29	6.50	6.50	8.46	7.47	5.00	7.50	8.46	9.49	4.00-12.00	7.65	7.95	7.88
Quart	15.60	11.32	11.00	12.16	18.50	10.43	12.41	12.25	9.00	14.14	11.37	16.82	8.00-25.00	12.89	12.71	13.52
5# Glass/Plastic	22.83	20.75	24.10	20.15	22.41	22.41	19.00	22.00	19.00	17.37	20.46	25.00	13.62-35.00	20.50	21.60	19.01
1# Cream	10.50	6.19	6.89	6.55	7.47	7.47	5.40	5.39	7.47	6.94	8.02	8.25	3.99-12.00	6.94	7.16	6.43
1# Cut Comb	8.58	6.48	8.10	6.30	9.03	5.50	7.00	11.25	9.03	10.33	9.75	13.00	3.00-16.00	8.55	8.43	7.71
Ross Round	9.67	5.98	8.19	6.10	8.02	8.02	6.00	9.00	8.02	8.02	10.33	7.60	4.00-12.00	8.04	7.12	7.53
Wholesale Wax (Lt)	5.05	4.73	4.60	3.80	2.73	5.75	4.25	8.00	5.00	8.00	3.63	5.50	2.25-8.00	4.64	4.65	4.34
Wholesale Wax (Dk)	4.81	6.95	4.60	3.61	2.90	4.17	3.83	7.00	4.37	4.37	2.90	4.00	2.15-7.00	4.17	4.19	3.76
Pollination Fee/Col.	93.00	107.50	76.67	55.00	60.00	45.00	54.60	75.00	87.64	60.00	90.00	98.75	35.00-165.00	75.28	76.68	78.62

It's Summers Time –

By the time you read this the holidays will most likely be over. I hope you all had a joyful time with family and friends. Now comes the hunker-down boredom of real Winter – January and February. My Winter activities used to include jigsaw puzzles with kids, board games, sledding, library time – anything I could think of to keep them happy and somewhat productive. When I had time to myself that involved crocheting, reading and going to exercise classes at our local rec center.

All that has changed. Of course the kid part changes when they grow up and have their own lives. The other parts changed a lot when I moved to the country. Reading is still a huge part of my life when I can find the time. Often it's late at night before going to sleep. But going into town, and all the way across to the other side of town when it's cold and windy and probably snowing, just to get to the rec center to exercise doesn't appeal to me much anymore. Now I go at lunch time with a couple of ladies from work and that works much better.

And now there are those chickens who don't hibernate for the Winter, but need attention everyday. The routine has changed with the cold weather. We don't just automatically let them out in the morning if it's cold and rainy – mostly because as clever as I thought they were, they don't come in out of the rain. They stay outside and get soaking wet (which is a pretty comical site). It doesn't seem to bother them too much, but I worry about them getting too cold. So some mornings the door stays closed and they are very vocal about how they feel about that. They are becoming increasingly tame and friendly and like I said – vocal. Kim has one that sits on the perch and eats out of his hand. And if you don't pay attention to her she "hollers" very loudly until you give her some scratch in your hand. We're still having a great time with those chickens. And still getting on average eight or so eggs a day – some days 10 or 11 and some days only five or six. Several of them are moulting right now. This is a little unnerving the first time you see it, even though you've read about it in all the books. I saw a big bare spot on one of their necks and first thought injury, but there was no blood. Then I saw a couple more that way and realized what was going on.

Then there are the Winter projects that you save just for this time of year. Cleaning and rearranging the basement, going through the closets, moving the furniture around – and books. We have so many books in our house, most of them bee books but not all – some gardening, crocheting, fiction, self-help – we've got a little of lots of different kinds. Well Kim was going to start sorting through them while he was recovering from his back surgery. Of course that was dependent on me getting the newest bookshelf put together, which I did. Only it didn't exactly fit where I thought it was going to, so that requires some rearranging and moving other bookshelves. Yep, you guessed it. That didn't get done either. So we have the empty bookshelf sitting in the middle of the computer bedroom with nothing on it. Now all I need is one strong boy for a couple of hours and we'll get this project under control.

Over the last month I have truly come to appreciate how much Kim does around the house now that I'm responsible for all of it. I always knew he was a really good guy, but now it's been proven. We do a dance in the kitchen in the morning when getting ready for work – he goes out and turns on the lights in the chicken coop, gets the girls going and then goes down to the road and gets the newspapers, while inside I'm starting breakfast and getting out the ingredients to make lunch. When he comes in I finish up breakfast while he makes lunch, then we sit down together and eat breakfast and read the two newspapers. The last few weeks there have been mornings when I remembered the chickens but forgot the newspapers, or forgot to feed the cats who are always waiting, forgot the chicken lights and then just went to McDonald's for breakfast.

He's doing much better now and hopefully we'll have our morning routine back soon. Thank you to all of you who have sent your prayers and kind wishes our way.

This week we lost a friend. Her name was Anne and she came to our Medina County Beekeepers meetings almost every month with her daughter, MJ. Anne would have been 83 just two days after her passing. She was frail these past couple of years. This from years of battling cancer off and on. But she always smiled when she saw me and gave me a big hug. She always noticed when I'd lost a few pounds or had a new haircut – always something kind and positive to say. And in spite of some physical limitations, Anne and MJ traveled to the EAS meeting for the last four or five years – Rhode Island, Vermont – it didn't matter how far. They showed up. She and MJ were a pair. We will all miss her, but MJ will miss her most of all.

Kathy Summers

A Closer LOOK

FOOD PRODUCING GLANDS

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

Evidence suggests the existence of a chemical signal from honey bee brood which activates protein synthesis of hypopharyngeal glands of nurse honey bees.

Food producing glands play an important role in honey bee nutrition and caste differentiation. Two glands, namely the hypopharyngeal and mandibular glands in the heads of younger workers called nurses, produce proteinaceous secretions (larval food) that is progressively provisioned in a small pool surrounding each larva. The ratio of hypopharyngeal to mandibular gland secretion deposited varies depending on larval age, sex and caste. Female larvae chosen to be reared as queens are mass provisioned nearly 100% mandibular gland secretion during the first three days of larval life followed by a 1:1 ratio of mandibular to hypopharyngeal gland secretion over the final two days as a larva (Beetsma 1979; Brouwers et al. 1987). This mixture fed to queen larvae is commonly called "royal jelly" (Winston 1987). Proteins belonging to the major royal jelly protein family constitute 90% of total royal jelly proteins which are produced in both glands (Santos et al. 2005; Scarselli et al. 2005). Worker larvae are progressively provisioned "worker jelly", a 2:9:3 ratio of mandibular to hypopharyngeal gland secretions to pure pollen (Beetsma 1979). Fourth and fifth instar worker larvae are also given some honey inducing a phagostimulatory response (plant substance that induces feeding), as well as pollen to accommodate the rapid rate of growth of these latter instars (Brouwers et al. 1987). Male larvae are provisioned food of lower protein quality but greater quantities due to their larger size and longer developmental time (Brouwers et al. 1987; Winston 1987).

Evidence suggests the existence of a chemical signal from honey bee brood which activates protein synthesis of hypopharyngeal glands of nurse honey bees. By using colonies divided into brood-right and broodless portions with single or double screens, Huang et al. (1989) found that the signal can only be obtained by worker bees if they have direct access to the brood. Larval pheromone and pollen are necessary for hypopharyngeal gland development, activity, and protein production (Brouwers 1982; Hrassnigg and Crailsheim 1998a; Huang and Otis 1989; Huang et al. 1989; Mohammedi et al. 1996). Larval brood pheromone in combination with an unmated queen have priming effects on worker hypopharyngeal gland development by increasing amount of extractable protein (Mohammedi et al. 1996). Two components of brood pheromone, methyl palmitate and ethyl oleate, were shown in laboratory studies (Mohammedi et al. 1996) to increase the activity of the hypopharyngeal glands. When added to colonies in the Spring, Summer and Winter, brood pheromone increases amounts of extractable protein from hypopharyngeal glands (Pankiw et al. 2004, 2008).

The proteins secreted with the jelly are mainly derived from pollen, which is ingested in large quantities by the nurse bees (Crailsheim et al. 1992). The addition of pollen in the diet increases glandular protein

"The hypopharyngeal gland of the worker bee is a paired long tuberous organ consisting of a great number of lobes, called acini which are connected to a common secretory duct."

biosynthesis resulting in greater amounts of extractable protein (Brouwers et al. 1987; Haydak 1970; Herbert and Shimanuki 1977). Nurse bees will appropriate proteins from their own bodies for larval food biosynthesis if pollen is not available (Haydak 1970; Hrassnigg and Crailsheim 1998a,b).

During Summer, the larvae are fed by nurse bees five to 20 days-old with fully developed hypopharyngeal glands which show high rates of protein synthesis (Brouwers 1982). In Winter, when there is no brood in the colony, the glands are fully developed (hypertrophied), yet demonstrate low rates of protein synthesis. However, when the queen starts laying in the Spring, or when brood is introduced artificially, protein synthesis of hypopharyngeal glands is activated and increases to a maximum within three days (Brouwers 1982, 1983).

The role that primer pheromones play in the functional physiology of food producing glands was examined (Peters et al. 2010). The combined and separate effects of queen mandibular pheromone (QMP) and brood pheromone (BP) on the amount of protein extractable from hypopharyngeal and mandibular glands of workers reared for 12 days with and without pollen diets was measured. In rearing environments with a pollen diet, BP, and QMP + BP pheromone treatments significantly increased extractable protein from both glands. Bees reared with QMP + pollen had amounts of protein

"The paired mandibular glands are found on each side of the bee's head, each attached to its mandible by a duct."

extractable from both glands that were not significantly different from control bees (no pheromones, no pollen). Pollen in the diet alone significantly increased amounts of protein extractable from glands versus control. In rearing environments without pollen, QMP + BP had a synergizing effect on amount of protein in both glands. The QMP + BP treatment was the only rearing environment without a pollen diet where protein amounts were significantly greater than the control. The synergizing effect of QMP + BP on extractable mandibular and hypopharyngeal gland protein suggests a highly derived role for the combined effect of these two primer pheromones on honey bee cooperative brood care. Amounts of extractable protein from both glands declined significantly with age of workers in all treatments. However, treatment significantly affected rate of decline.

The hypopharyngeal gland of the worker bee is a paired long tuberous organ consisting of a great number of lobes, called acini which are connected to a common secretory duct. Each acinus is composed of about a dozen secretory cells. Secretion reservoirs are formed within the intracellular ductules. They are surrounded by a sheath of numerous microvilli. Larval food proteins are secreted into the reservoirs and stored. Even in foraging bees, small amounts of larval food proteins are stored, indicating the flexibility of the worker to potentially react to changing colonial and environmental conditions (Knecht and Kaatz 1990).

Although acini diameter is generally correlated to protein content and secretion, glands with particularly large acini sometimes occur that show relatively low levels of secretory activity (Brouwers 1982; Huang et al. 1989). Wegener et al. (2009) placed the glands into three different classes based on their morphological characteristics. Class one consisted of glands with small acini showing an uneven surface, which is characteristic of overwintering workers and young workers from colonies containing a queen but no brood (Fluri et al. 1982; Deseyn and Billen 2005). Glands with this morphology are known to contain large amounts of protein, but synthetic activity, as measured by the rate of incorporation of radiolabelled leucine, is far lower than in nurse bees (Huang et al. 1989). In class two, the acini were medium-sized to large with a smooth surface and numerous secretory vesicles, giving them a yellowish color. These glands are characteristic of active nurse bees (Fluri et al. 1982; Brouwers et al. 1987; Deseyn and Billen 2005). Synthetic activity in this type of gland is high (Huang et al. 1989; Brouwers et al. 1987).

Class three contained glands with large, but slightly pale and translucent lobes which corresponds to the glands of forager bees (Deseyn and Billen 2005). These glands are known to contain very low levels of RNA coding for jelly proteins (Ohashi et al. 1997).

Ultrastructural changes of the hypopharyngeal glands were analyzed during imaginal (having the form of an adult insect) development of worker honey bees (Knecht and Kaatz 1990). In the pharate (the adult insect prior to emergence from a pupa) adult worker, the rough endoplasmatic reticulum (RER) of hypopharyngeal gland cells is scarcely developed and spheroidally arranged.

During the first few days after emergence the RER increases rapidly until at day eight most of the space between the secretion reservoirs is filled by well-developed lamellar stacks of RER, which is typical of protein-secreting cells. In foragers the RER decreases and only parts remain. This pattern of ultrastructural development corresponds well to the total protein synthesis monitored in the hypopharyngeal glands *in vivo* (Latin: in life; experiments done in a system in which the organism remains intact). Until day four after emergence, protein synthesis increases more than 20-fold. During the nursing phase, especially from eight to 16 days of age, the highest rates of protein synthesis are observed in the hypopharyngeal glands. After day 20, protein synthesis declines drastically by more than 90% within four days and remains at a low level in field bees. Even though hypopharyngeal glands degenerate when bees become foragers, bees at the beginning of their foraging career can still have well developed glands. The age at which the glands degenerate is quite flexible. It depends on colony conditions and the time of the year.

The paired mandibular glands are found on each side of the bee's head, each attached to its mandible by a duct. These are large glands, extending to the base of the antennae in the workers, and release of their active products is controlled by a valve which allows the bee to regulate the discharge of secretions from a storage sac (Winston 1987). Nurse bees produce 10-hydroxy-(E)-2-decenoic acid in their mandibular glands, and this compound is the main component of the brood food fed to larvae. This acid is present in trace amounts in newly emerged bees, but the amount increases up to 60µg/bee and is detectable throughout the life of the worker (Boch and Shearer 1967).

As adult bees age or task performance changes, so does gland function. Hypopharyngeal glands switch from protein production to enzyme production used for making honey and similarly mandibular glands switch to 2-heptanone alarm pheromone production (Winston 1987). The hypopharyngeal gland cell of the forager bee expresses at least three genes for carbohydrate-metabolizing enzymes, â-glucosidase, amylase and glucose oxidase, that are not expressed by the hypopharyngeal gland cell of the nurse bee (Ohashi et al. 1999). Amylase is thought to be needed to convert starch of plant origin, which is found in nectar, into glucose, and glucose oxidase is needed to convert glucose to gluconic acid and hydrogen peroxide (Winston 1987; White et al. 1963). The gluconic acid keeps the honey acidic and, together with hydrogen peroxide, it has an antiseptic action. Thus, these enzymes are essential for the forager bee's task of converting nectar into honey. â-glucosidase is the major protein present in the hypopharyngeal gland of the forager bee, reaching about 50% of the total protein of the gland (Kubo et al. 1996). Amylase and glucose oxidase each account for approximately 2-3% of the total protein (Ohashi et al. 1999). Thus, the hypopharyngeal gland cell function of the forager bee is highly specialized, expressing specifically the genes for enzymes that are needed for honey production. It is uncertain whether each secretary cell expresses the genes for all of these enzymes. BC

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Clarence Collison is an Emeritus Professor of Entomology and Department Head Emeritus of Entomology and Plant Pathology and Audrey Sheridan is a Research Technician at Mississippi State University, Mississippi State, MS.

Revisiting Powdered Sugar For Varroa Control On Honey Bees (*Apis mellifera* L)

Jennifer **Berry**

Prior to our study, when an experiment required *Varroa* free colonies, we would dust bees with powder sugar as a means of removing mites. Dusting with powder sugar was also gaining popularity in the beekeeping arena as a method of controlling *Varroa*. In 2009, researchers in Florida conducted a study which examined the efficacy of powder sugar and found it did not help in controlling *Varroa*. However, even though the study was sound, powder sugar only dislodges phoretic mites and not ones inside the cell. Therefore, for powder sugar to be effective it would have to be applied during broodless periods, which Florida rarely experiences due to its warmer climate. So we decided to design an experiment that would test the efficacy of powdered sugar when applied during broodless times verses when brood was present.

Unfortunately, as the study revealed, relying solely on powdered sugar as a means of controlling *Varroa* mites does not keep mite populations from reaching devastating levels. This was bad news for us here at the lab. We were hoping that powdered sugar would be the cure-all, a silver bullet, that one control method that worked which didn't include chemicals in the mix, but it's not. Yes, it does work at dislodging mites but is not "powerful" enough to remove enough mites in order to keep them from eventually causing damage to colonies. If you are or are planning to use powder sugar, be aware that it needs to be "part of" your *Varroa* management scheme and not your only choice.

Below then is the paper we published showing the results of our study. It was originally published in the Journal Of Apicultural Research, an IBRA publication www.IBRA.org. We thank them for permission to reprint this important study on these pages.

Dusting bees with powdered sugar has been examined as a remedial control for *Varroa destructor* Anderson and Trueman. Two modes of action have been proposed: one being that fine dust impedes locomotion of phoretic mites and induces them to fall off bees (Ramirez, 1994), and another being that dust induces a grooming response in bees that similarly dislodges mites (Macedo *et al.*, 2002). When measured as a percentage of phoretic mites dislodged, powdered sugar dusting has achieved experimental knock-down rates ranging from 77% (Aliano and Ellis, 2005) to more than 90% (Fakhimzadeh 2001, Macedo *et al.*, 2002), but a persistent problem has been translating these kinds of results into practical field applications. The most comprehensive examination of powdered sugar as a field-level *Varroa* control was the work of Ellis *et al.* (2009) in Florida. These authors dusted the top bars of brood combs with powdered sugar every two weeks from April until the following February (11 months), compared numerous parameters of colony strength and *Varroa* populations against a control group, and found no treatment effects on any parameter of interest. In spite of these negative – and convincing – results, we wanted to do a field study that (1) exploited a brood-free period of the season when all mites are phoretic on adults and vulnerable to dust treatment (bee colonies in sub-tropical Florida are rarely brood-free), (2) compared more than one dust delivery method, and (3) compared more than one treatment timing interval. We felt that these outstanding questions should be resolved before we abandon powdered sugar as a bee-safe (Fakhimzadeh, 2001) and chemical-free *Varroa* control option.

We set up 64 equalized, queen-right colonies (single-body Langstroth hives with screen floors) and divided them equally between two apiary sites in Oconee County, Georgia, USA (33°50' N; 84°34' E). Once in their respective apiaries, each colony was randomly assigned one of eight (2^3) treatment combinations: (1) initiation of powdered sugar treatment (a) in January (broodless period) or (b) in March (brood area rapidly expanding), (2) treatment applied at an interval of (a) every other month for a duration of nine days (four treatments three days apart) or (b) treatment applied one day at an interval of every two weeks, and (3) powdered sugar applied as (a) a dusting of 120 g (250 ml) powdered sugar with a sifter over the top bars of brood combs then brushing the sugar down between frames using a bee brush or (b) powdered sugar (same quantity) blown into the hive entrance with forced air from a shop vacuum custom-fitted with a chamber made of polyvinyl chloride (PVC) plumbing components holding the powdered sugar. There were eight colonies (replicates) per treatment combination. The treatment interval ran from Jan-Oct, inclusive.

As an appendage to this balanced design, we set up and managed an additional eight colonies as negative,

Dusting bees with powder sugar to dislodge mites.

Dusting bees with powder sugar using a flour sifter.

non-treated controls (never treated with powdered sugar or any remedial action), raising the experiment to n=72 colonies. These colonies provided an additional treatment group for comparison in one-way ANOVAs against the simple effect of powdered sugar.

After colonies were established, they were managed optimally for swarm control and honey production while administering the prescribed treatments. In January prior to administering the first treatments and again in May and October, we collected the following measures of colony strength and mite numbers using published methods (Ellis *et al.*, 2009): bee population, brood area (cm^2) (only in May and Oct), brood viability (72-hr survivorship of open larvae), and number of phoretic mites per 100 bees (derived from strained alcohol samples of ~300 bees). Additionally, the number of mites retrieved on three-day bottom board sticky sheets (adjusted for mite catch per 24 h) was collected for each surviving colony on 19 Jan, 8 Mar, 16 Apr, 1 Jun, 25 Jun, 30 Jul, 17 Aug, 25 Sep, and 11 Oct. All statistical analyses were done with SAS JMP (version 8.0.2).

Our first question was simply whether *Varroa* mite levels were affected by powdered sugar treatment. To test this, we pooled all 64 colonies in the balanced experiment into one "treated" group (irrespective of the 2^3=8 sugar combinations described above), assigned each a random number, and sorted them by random number, thus creating eight randomly-assigned groups of eight treated colonies. Each of these treated groups thus presented a comparison group to the eight untreated control colonies, essentially letting us perform eight separate ANOVAs on the dependent variables. In two of eight ANOVAs (25%), powdered sugar significantly reduced colony mite levels. In one analysis, the number of phoretic mites per 100 bees averaged across Jan-Oct was significantly (F=4.4; df=1,14; P=0.0537) lower in the treated group (3.0 ± 0.98 (mean ± SE), n=8) than the control group (6.0 ± 0.98, n=8). In another analysis, the number of mites caught on sticky sheets per 24 h averaged across Jan-Oct was significantly (F=4.7; df=1,14; P=0.0475) lower in the treated group (24.4 ± 7.3, n=8) than the control group (46.9 ± 7.3, n=8). No other parameters of interest responded to powdered sugar in these tests.

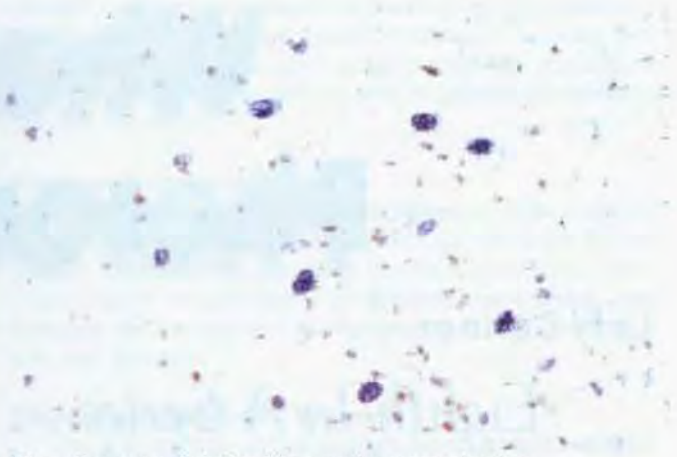
After dusting colonies with powder sugar, inserting sticky screens in order to count mite drop.

We next turned our attention to the balanced experiment in order to tease out effects of month of treatment initiation, mode of dust application, treatment interval, and any interactions thereof. The only significant effect in a whole-model analysis was an interaction between mode of application and treatment interval for cm^2 brood in May. Deeming this uninteresting, we simplified the analyses by treating month of initiation, mode, and interval as simple effects in one-way ANOVAs. The number of phoretic mites per 100 bees in October was significantly (F=4.8; df=1,22; P=0.0401) lower in colonies in which powdered sugar treatment began the previous January (3.4 ± 0.9 mites (mean ± SE), n=11) compared to colonies in which treatment was delayed until March (6.1 ± 0.8, n=13). This suggests that powdered sugar dusting is more efficacious when it can be applied early and exploit a winter brood-free period. Colony bee population in May was significantly (F=3.9; df=1,61; P=0.0524) higher in colonies in which powdered sugar had been blown into hive entrances (8496 ± 710 bees, n=32) compared to colonies which had received powdered sugar by sifting onto exposed brood comb top bars (6493 ± 721, n=32). This suggests that applying powdered sugar with forced air at the hive entrance was less disruptive to bee populations than exposing and dusting comb top bars. No other parameters of interest responded to independent variables in these one-way ANOVAs.

A final observation of interest is the number of colonies surviving at the end of the experiment. Of the eight non-treated control colonies, three (3/8=38%, n=1) were alive in October. Average survival among the eight sets of randomly-derived treated colonies was 39 ± 6.4% (mean ± SE), n=8).

In conclusion, powdered sugar treatment resulted in lower colony *Varroa* levels in two of eight (25%) separate analyses. We have evidence that powdered sugar is most efficacious when it can be applied early in the season and exploit a winter brood-free period. A labor-saving technique of applying powdered sugar dust at hive entrances with forced air appears to be less disruptive to colony bee populations than a more invasive practice of sifting sugar onto exposed brood comb top bars. In spite of these highlights, we cannot pretend that these results are a strong affirmation of powdered sugar in the fight against *Varroa*. The method was ineffective at reducing

Charlie Gwyn and Graduate student, Brett Nolan testing out the dustructor.



Mites that were dislodged by powder sugar dusting.

Varroa in 75% of our analyses. Moreover, 10-month colony survival between treated and non-treated colonies was virtually identical, and poor, at 38-39%. Powdered sugar is, at best, another "weak" IPM component that may contribute toward *Varroa* management when used in conjunction with other components. BC

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

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What Is A Pheromone?

Larry **Connor**

Eighth In A Series . . . Examine How These Materials Are Used In The Hive

Classroom

Honey bees use a number of method to communicate. In this lesson we will start to explore the role of pheromones in honey bee communication and biology. The term pheromone is based on the Greek word *pherein* (to transport) and *hormone* (to stimulate). It refers to chemical messengers that move outside the body of an animal and result in a change in another animal of the same species. Those changes may be hormonal or behavioral. Pheromones cause animals to aggregate (group together, such as when feeding), sound an alarm (when under attack), mark a territory, release a behavior, mark a trail (as in ants), finding mates (sex), establish dominance (by royal individuals), recognize closely related individuals (to prevent mating and inbreeding), and calming (in mammals).

All major animal groups have developed pheromones, although the data on birds is limited. A common example in humans is the coordination of menstrual cycles among women, especially those living in close proximity, and who respond to the pheromone in sweat. The perfume industry is no stranger to the power of chemical signals in sexual attraction.

Dr. Mark Winston's book *The Biology of the Honey Bee*, (Harvard University Press 1988) contains a concise summary of the basic bee pheromone biology. Elsewhere Winston and his colleagues have written that there is *a remarkable and unexpected complexity in social insect pheromone communication, particularly for honeybees.* Dr. Dewey Caron's textbook *Honey Bee Biology and Beekeeping* (Wicwas Press 1999) dedicates a full chapter to chemical communications in the honey-bee colony.

John Free *(Pheromones of the social bees*, Comstock 1987) states that honey bees have 15 glands that produce a wide range of chemical compounds, all working as chemical messengers between the queen, drone, worker and laying worker and other bees in the colony. Because these chemicals occur in different mixtures, considerable diversity of behavior is possible.

After the beekeeper worked the hive, these worker bees are scenting the inner cover with their Nansonov glands exposed and fanning their wings to spread the odor of the pheromone to to bees searching for the entrance of the hive. Note how the bees have extended their legs, lowered their heads and raised the tips of their abdomens. Several clearly show the exposed Nasonov glands at that tip.

Pheromones produced by worker bees

Workers produce the **Nasonov pheromone** to assist with communication. They are a group of air-borne chemicals that include:

Geraniol
Nerolic acid
Geranic acid
(*E*)-citral
(*Z*)-citral
(*E-E*)-farnesol
Nerol

These chemicals are produced in the Nasonov gland positioned at the dorsal tip of a worker bee's abdomen. Newly emerged bees produce little of the chemicals, but their production level increases with time and reaches a peak at four weeks, or about the time of foraging activity. When the worker exposes her Nasonov gland, she fans her wings to spread the molecules in the air. Using these chemicals, bees perform these activities –

1. At the hive entrance bees release the pheromones to **guide returning foragers** and workers making orientation flights. Beekeepers often see this behavior during and after a session with the bees when the colony has been disturbed, combs moved, and the bees otherwise disrupted. Bees isolated from the rest of the hive may be seen scenting.
2. When bees are working on forage that lacks a strong natural order, as seen in a feeding station where only sugar syrup is provided, bees use Nasonov pheromone to **mark** the forage that lacks a strong odor. They also

use where the bees are collecting water. This assists incoming forgers find something that does not have a natural odor. It is very unusual to find bees scenting on natural flowers.

3. During swarming, these Nasonov chemicals are critical in the task of **keeping the swarm organized**. During their departure from the hive, while on-route to the temporary regrouping area, and then while on the way to the final nest site, bees in a swarm use the chemicals to keep the group together. They also use it to mark the location of the temporary resting site as well as the entrance of the cavity that the have selected to be their new home. It is thought that the queen herself uses these molecules to orient within the swarm, and her royal pheromones undoubtedly work in conjunction with the Nasonov compounds to keep the swarm intact. Beekeepers know that a swarm without a queen will eventually return to its initial nest.

Another worker-generated compound is the **footprint pheromones**. These odors are left by worker bees at the entrance of the hive and on flowers. It is unclear whether these compounds are produced by the Arnhart glands in the tarsal segment or are produced elsewhere on the bee's body and deposited by the feet. When the footprint pheromones are found at feeding sites, more bees are attracted to the location. They are believed to combine with the Nasonov substance to produce a chemically attractive hive entrance for returning forager and bees on orientation flights. This is a synergistic combination of two different compounds for an improved outcome.

Beekeepers are familiar with the next group of worker-bee produced pheromones, the sting-produced compound (Z)-11-eicosen-1-ol. This is both an alarm compound and attracts other worker bees. Another odor, thought to be produced by the dorsal (top) surface of the abdomen, is called the forager-marking pheromone.

Workers produce a variety of odors employed to initiate the **alarm and coordinate colony defense**. One compound is 2-heptanone, produced in the mandibular glands of workers, while the remaining compounds are produced within the sting structure, most likely in the membranes at the base of the sting lancets. These molecules work together to tell other bees that the colony is under attack and to mark the location on the attacker where the warning sting was inserted. The stinging experience is complicated, and combines chemical signals with movement behavior to result in a full response. 2-heptanone does not illicit a strong response. Another compound, isoamyl acetate (also labeled isopentyl acetate or IPA) is 20 to 70 more times likely to result in a sting behavior response. Add to these the chemicals butyl acetate, 1-hexanol, n-butanol, 1-octanol, hexyl actate, oxtyl acetate, n-pentyl acetate and 2-nonanol. These are highly volatile low molecular weight chemicals. They are released into the air and attract other bees, often resulting in defensive and stinging behavior.

Isoamyl acetate and other defense chemicals are released when a bee stings and the sting membranes are torn. Then it attracts other worker bees to the defense site and increases the intensity of the defense response. A strong banana-like odor should instruct the beekeeper to close the hive and let the bees settle for a day or more, or be faced with multiple stinging attempts. The use of smoke interferes or masks the bees' alarm pheromone.

2-heptanone is used to deter potential enemies and robber bees. It may be used as an anesthetic to paralyze intruders, allowing the bees to remove paralyzed individuals from the hive.

Forager pheromone

Older forager bees release **ethyl oleate**, often detected by nurse bees by antennal contact on the body of the forager. This compound slows the development of nurse bees. This is an example of a **primer pheromone**, and it keeps the age ratio of nurse bees to forager bees in a efficient balance.

Pheromones produced by brood

Developing bees and pupae produce a **brood recognition pheromone** that inhibits worker bee ovary development, and helps nurse bees discriminate between drone and worker brood. It draws nurse bees to the brood, and is used by beekeepers, often unknowingly, as a means of making new colonies.

The compound at work here is a 10-compound of fatty-acid esters which help regulate the adult caste rations. For a long time it was thought that queen pheromones inhibited the development of ovaries in worker bees, but now, instead, evidence suggests that the brood pheromones are responsible for this inhibition so workers do not lay eggs. It correlates with the observation that laying workers appear in a colony about month after a queen is removed and a replacement fails to replace her. This means the brood from the original queen has all emerged and is none left to suppress ovary development in workers.

In 1996 an artificial brood pheromone was developed by a team of researchers lead by French researcher Yves Le Conte.

Note: We will continue the discussion of other hive pheromones in the next article, including the pheromones produced by the queen bee.

Class Activities

Observation hive – Make arrangements to borrow an observation hive or set one up with your bees, perhaps from a nucleus. Make sure you include the laying queen bee, preferably marked for easy identification. In the classroom, have students observe the queen for shifts of two minutes, recording what the queen is doing during these time periods – inspecting cells and laying eggs, walking, resting, etc. As she does this have students count the number of worker bees that appear to be attendant bees, doing this four times, at 30 second intervals. Attendant bees are those that are touching the queen, feeding her, and otherwise somewhat focused on the work of the queen and nothing else. Repeat these observations on at least two different days. Have each student prepare a report of their observations, keeping in mind that each may have observed a different period of the queen's daily activity cycle.

Field session – Produce a temporary package of screened cage of bees from an existing hive or nucelus. Find the queen and cage her, without workers, in a plastic or wood and screen cage. Put her in the cage with the worker bees, but secure in the cage so she cannot get

out. The next day, remove the queen cage and fasten it to an artificial tree, or cross of wood, in the open air. Shake the worker bees at on the ground at the bottom of the tree and observe their searching and scenting behavior they use to find the queen. Put some workers on the queen cage to observe the scenting at a closeup basis. After a period of time the bees will have created an artificial swarm around the queen, and students should study the movement of bees in the swarm to see how it is structured by the bees.

Set up a second wooden tree and carefully remove the queen in her cage and gently brush off ALL the attendant bees on the cage. Move the queen to the second tree located 15 to 20 feet away from the first tree, and expect to spend several minutes watching the bees break the cluster, search for the queen, find her, start scenting her new location, and then regrouping to the second tree.

As a group examine the changes to the bees and how they deal with the loss of their queen. A review of the pheromones involved in this behavior is part of the session.

If possible video record this exercise, and try to get as many closeup views as possible. Have the students compile the video into a report, to share with other students and family. BC

Vocabulary

pheromone, alarm, volatility, aggregation, releaser pheromone, Nasonov gland, footprint pheromones, brood pheromones, 2-heptanone, isopental acetate (isoamyl acetate), swarm organization, breaking behavior, queen retinue, egg laying behavior, royal dominance, trail pheromones, repellency, primer pheromone, ethyl oleate, nurse bee to forager bee ratio

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HOW I DO IT –

Recovering From An Unexpected *Varroa* Attack

James E. **Tew**

An announcement: *After a couple of years in development, a beginning beekeeping video series is posted at:* ***www.ohiostatebeekeepers.org/beekeeping_class/*** [1] *The project was supported by the Ohio Produce Growers and Marketers Association, the Ohio State Beekeepers Association, John Grafton, retired state inspector from the Ohio Department of Agriculture and me, Jim Tew. This initial series is an examination of both traditional and problem-solving beekeeping. Have a look.*

Well, this is certainly embarrassing

Mozilla *"Firefox"*, the web browser I use, has a cutesy ditty it posts when a requested url does not load. It posts the message, *"Well, this is certainly embarrassing!"* and then it goes on to tell what specific event did not load. That message fits my mood at this moment.

Having recently retired and no longer having ready access to university bees, I was suddenly completely bee-less. No doubt, I wrote about this in previous articles. Essentially, last Spring, I started over with ten packages of bees that I bought with *"my"* money. I documented the package installation event in a posted video series at: **http://goo.gl/9izSl**. The wind was horrendous the day we released the bees.

With beekeeping, there is always something. Two of the packages immediately went queenless. Through the years, my approach to queenless packages has been to combine them with a stronger colony and then split them out later during the Summer. Though I am vested in a second queen, at least the new queen *"should"* have access to a larger population of diversified worker bees. John Grafton and I showed a common way to install a new queen in an established colony at: **http://goo.gl/asrNx**.

Finally, one way or the other, seven of the packages got a grip on life and began to prosper and prosper they did. The magnificent seven grew to fill three deeps and, in two instances, a shallow super, too. Bees bearded on the front of the colony. There were clouds of bees flying out and foraging. Even though the drought we had in Ohio was impressive, it was a good Summer. I went about my business and – as I have told so many of you – I let my bees be bees. I did not bother them. This is their first season as a colony. Even though they had made a lot of honey, I planned to let them keep it. *"The first Winter is always the worst."* I wanted them busting strong through the Winter season. After extensive travel and a busy Summer, I strolled to my apiary with camera in hand. My initial purpose was to gather a few entrance pics for an upcoming presentation on evaluating colonies without opening them.

Well, this certainly is embarrassing! What I found was one of the bigger disappointments of my recent professional life. It was dying bee chaos in the yard. Everywhere, bees were flying, crawling, and dying. Not a single one of the seven colonies had escaped. Could it get any worse? Yes, it could, because robbing had become a major issue. That only added to the absolute confusion.

An aside

About a year ago, a colleague told me that I write mostly negative stuff in these columns. That stung a bit, but only a bit. I try to write ***real*** stuff and I suppose that real stuff could appear to be negative. Part of the reason I don't write more about the things that go correctly is the difficulty in objectively presenting the positive result. *Look at me! Look at me! My bees made a lot of honey – or whatever.* I have been doing this bee thing long enough to know that if my bees did well at a particular time; they will surely perform poorly at some other time in the near future. Then I would be forced to write a negative article. Good things do happen, but I just don't say much about them. It's just beekeeping.

When I found that these beautiful colonies were collapsing – apparently due to *Varroa* predation – I was disappointed, disgusted, angry and embarrassed all at once. While I gave no notion of quitting beekeeping, I gave serious thought to throwing something or kicking something – anything. It was really disappointing.

Treating Packages for *Varroa*

Historically, I have not treated 1st year packages for *Varroa*. I have told many, many new beekeepers with new colonies that, *"They get a free first year from package bees."* They should not have to treat for any pest or pathogen for the first year. What was so painful was that I had $800 of my personal money invested in those packages – ***my money***. I paid $800 for a lesson, but at this point, I am not quite sure exactly what I have learned.

I am not yet blaming the package producer. Similar packages from the same producer in other areas in Ohio and in other states built up as I described and are powerful until

[1] A shortened url to the same address is: **http://goo.gl/KmSLU**

the present. As has become typical in beekeeping arenas, I don't know why *Varroa* populations built up so fast in my first-year package colonies. These colonies had grown to have such a large worker bee population with impressive honey stores.

Yet, as though it were a simple case of common sense, others have bluntly responded to my plight that they had always treated newly installed packages. I have always tried to treat – with anything – only when needed. So speculating that the package producer had treated on schedule and with meaningful chemical products, I have always chosen to give the bees a chemical break. While that procedure had always worked before, it spectacularly did not work this season.

This is what one of the entrances looked like.

Truth be told . . .

I was hoping – both openly and secretly – that worker bees and *Varroa* were coming to an evolutionary understanding and that, increasingly, I would not have to regularly apply control treatments. Finally, I would not have to treat at all. Somehow, all would be okay.

At the 2012 Fall meeting of the Alabama Beekeepers Association, I was truly surprised to learn that about 65-75% of the beekeepers present did absolutely nothing to control *Varroa*. Interestingly, the identical percentage was conveyed at the Oregon Beekeepers Association. Can I infer from anecdotal information from two states so distantly separated, that many, many of you are not doing anything to control *Varroa*? *Nothing* was what I have been doing for about the past four years. It seemed to be working.

The cost of doing nothing

This *Varroa*-control thing is presently all over the page. Those who have not yet been hit with a collapse are sure that they have found the right path when they do nothing to control the pest. Maybe they have the high road or maybe their time has just not yet arrived. Others are sure that screen bottom boards and possibly one of the essential oils or formic acid is a slam-dunk procedure. Then I read in the technical literature that research indicates that the screened bottom board is not particularly effective. Now some of us are celebrating the evolving permit to use a new amitraz product. In some instances, the evolving protocol is to assume you have the mites (we do), and routinely apply a synthetic chemical.

At an upcoming meeting this weekend, I will give a presentation on *Varroa* control techniques and I will say – as I have said to many other groups – that *Varroa* control techniques are a personal choice. Are you okay with approved chemicals? Are you avidly a non-chemical person? There is not a "one size fits all" recommendation for controlling this pest. Again, I say that this *Varroa*-control thing is all over the page.

Okay, my colonies are crashing. Now what?

Mine was not a difficult diagnosis. My colonies were in dire trouble. This was happening in October. The general recommendation is that any control treatment needs to be done by August. I was well beyond that time. I stayed with the *"do nothing"* plan for about two more days and found that I simply could not cling to that philosophy. One part of me knew that these bees were in serious trouble and that there was essentially nothing that I could do that would save them. Another more irrational part of me simply could not accept the reality that these nice colonies were going to die on my watch and that their death was caused by a completely unexpected *Varroa* attack. I broke and ordered traditional fluvalinate strips (Apistan).

Once installed, the product killed mites like crazy. So what? I am now left with small, defeated clusters that have no hope of survival and I had invested yet more money in this project. As of early November, three of the colonies are already dead.

I know that doing nothing– or very nearly nothing – to control *Varroa* is a popular trend. I tried that for several years with mixed results. I was expecting *"some"* of my colonies to die, but I was not expecting *all* to die. Though I made a honey crop from these dead and dying bees, I did not make enough honey to replace the bees next spring; consequently, I can no longer *do nothing* as a general health program for my bees and my *Varroa* mites.

So, now what?
Chemicals

I know that I am about to either disappoint or even outright annoy some of you, but I will buy either 10 splits or 10 packages next spring and I will treat whatever I buy with the remaining fluvalinate that I have already purchased. Beyond that, I will consider the new amitraz product if its use is approved in my state, and I will explore some of the softer chemicals. Either way, I will treat in the spring and in the fall with an approved product of some sort. I am only trying to destroy about 50% of my mite population and am trying to do that with the least harm possible to my bees.

I have several of the MiteZapper[2] drone frames. I will definitely use this chemical-free procedure for luring mites to drone brood where they will be killed with heat. I have used these frames in the past with good results but I will be much more diligent next Spring.

Nutrition

I have recently heard commercial beekeepers say that they do all they can to keep their colonies pumped up

[2]http://www.mitezapper.com/

There were innumberable disoriented, crawling bees around the hive.

with vitamins and minerals. One way they do this is by feeding a supplemented pollen substitute through the warm season. At this time, I don't know if I can afford that investment, but I am going to, at least, explore keeping pollen substitute on when there is an inadequate pollen flow. That should keep the small hive beetles happy *(that's a bad joke)*.

Water

I have written and videoed copiously about water for my bees and my neighbors. Nothing more needs to be said about that subject other than the fact that I will continue to upgrade my bees' water source. Many years ago, I read in some long-forgotten place that a small common water source can be a source for spreading diseases such as Nosema. I will plan to frequently empty the water supply and restore with fresh water. This water thing may or may not be an issue but I need to do this to keep good neighbor relations so I will just add this improved water supply to the "healthy colony" list, too.

Queens

I don't know what to say about queens. I want to explore getting higher quality queens but I am uncertain from where to get them and what type. As with various types of *Varroa* control, many of you are strongly opinioned about particular queen types. Since there are so many other colony variables, I have always just wanted to get a "*pretty good*" queen.

Or could the queens be okay but the drones are the shortage? Drones are preferentially attacked by *Varroa*. Though I ended up with seven pretty good queens from my packages this past season, three packages had terminal queen issues. Is 70% queen acceptance good enough? Barely.

Colony and hive management

So much as possible, I will continue to disturb my bees as little as possible. I will ventilate the hives. I am going to move my apiary more into the sun. That may or may not help, but some of you are convinced that sun colonies are healthier than shaded colonies.

While my combs are all reasonably new, I will begin the process of dating my combs and replacing them after three to five years. As with shade and water, this may or may not be an issue, but increasingly experiments are showing that wax combs can be contaminated by a variety of chemicals.

My plan – at this time

I will get more bees next Spring, but I will have much more respect for *Varroa*. I had grown a bit complacent. I'm awake now. Everything else I have listed is nothing more than an effort to keep my future colonies vigorous and healthy. If this works, it will result, no doubt, in swarming issues but that can be subjects for upcoming *BC* issues. Right now it seems to me that worrying about swarms is better than dealing with dead bees. As usual, I will keep you informed. BC

Dr. James E. Tew, State Specialist, Beekeeping, The Alabama Cooperative Extension System, Auburn University, **Tewbee2@gmail.com; http://www.onetew.com; One Tew Bee** RSS Feed (**www.onetew.com/feed/**); **http://www.facebook.com/tewbee2**; Twitter **@onetewbee**

Got A Question?

Ask Dr. Phil

Phil **Craft**

He Knows!

Send your questions to Dr. Phil at philcraftbeekeeping@windstream.net

A beekeeper from Kentucky writes:

Last April I started my first two hives. Both hives face pretty much straight south. I could move B to a spot 11 feet to the east of A, where it would be in full sun all day. I was thinking I might move it there this Winter. Do you think that's a good idea?

Phil replies:

In the past I advised beekeepers, whenever possible, to locate their hives where they would receive some mid-afternoon shade. Though hives do very well in the open (think of all the beekeeping that occurs in the great plains – places like Texas and the Dakotas which do not exactly evoke images of cool, refreshing groves), a little shade helps to cool hives during the hot part of the day. However, that advice was prior to the advent of the small hive beetle, a pest which has become a problem in the last several years. Beetles seem to be more troublesome when hives are located in the shade, probably because of the soil's being moister there. Small hive beetles pupate (go through the cocoon stage of their life cycle) in the ground, and they need dirt that's sufficiently moist in order to mature successfully. Soils in many parts of the United States, including Kentucky, become hard and dry in Summer's heat which somewhat inhibits the beetles' reproductive cycle. By locating hives in the shade, we may actually be encouraging the proliferation of small hive beetles. Since you live in an area where beetles are common, I believe that moving your hives into full sun is a good idea.

Hives in the sun. (photo by Mary Parnell Carney)

A beekeeper from Kentucky writes:

I have a hive I wish to re-queen in the spring, but I have been told I must find and kill the old queen. However, I seem to never be able to find the queen in my hive. Do I have to find the old queen when re-queening and if I do, how can I find her?

Phil's reply:

When doing hive inspections, it isn't always necessary to find the queen. Just seeing eggs or small larvae tells you that she was present in the last few days, which is close enough. However, in re-queening a hive, it's imperative to remove the old queen. This normally means finding and killing or at least relocating her to a new home. I know that finding, or rather identifying, the queen on a frame swarming with bees can be a daunting task for a new beekeeper. It's a skill which becomes easier with experience, but that doesn't help the new beekeeper at the other end of the phone line or the email link asking me for help in finding the queen. Here is the advice I give them.

First use as little smoke as necessary – just a few puffs in the hive's entrance and over the brood box after removing the hive covers. Then think of what the queen is doing and how this influences where she is likely to be. Her job is to lay eggs, and she will most likely be on frames where there are empty cells in which to lay them. Beginning with the frames in the top box, remove and look quickly at each one. She is unlikely to be on frames full of honey, nectar, brood, or pollen, so a brief glance at those is sufficient. Concentrate on frames with empty cells which are located near frames with eggs or larvae (uncapped brood). If you don't see her the first time through, repeat the search. Though I'm pretty good at finding queens, sometimes I also have to go through

Unmarked queen. (photo by Mary Parnell Carney)

a hive more than once before I'm successful. If you still have trouble locating her, you might consider asking a more experienced beekeeping friend to lend a hand.

Another tip which makes the task of finding queens easier for novice and experienced beekeepers alike is to purchase marked queens or mark them yourself. They are easier to spot, and there are additional benefits. I mark my queens, not only because it is easier on my aging eyes when I am hunting for them, but also because it helps me to keep track of the ages of the queens in my hives and to know when they have been replaced through supersedure or swarming. An unmarked queen means that a new queen has appeared since I last checked the hive. When I see a marked queen, I can check my records to see when I marked her, giving me her approximate age.

A slower but more certain method of locating elusive egg layers is described in a nice article entitled *Queen Finder* by Peter Smith. It appeared in the September 2000 issue of *Bee Culture*, and describes using a queen excluder as a sieve to isolate a hive's queen. I often refer beekeepers to this article, which is available in the *Bee Culture* webpage archive.

A beekeeper from Indiana writes:

I am hoping you might have an answer for me on something I ran into this year with my honey. I am fairly new to this and haven't seen this before. I got my supers off and was uncapping and spinning out honey and noticed this honey that had a greenish tint and actually the combs after spinning out the honey were tinted this greenish blue also. I didn't have many frames to spin (12) but six were discolored this way and the honey just doesn't look right. So do you have any idea as to what is happening here? Thanks for any advice you can give me.

Phil's reply:

I can't tell you the reason for the unusual appearance of what you extracted from your hives, but I can offer a few possible explanations. Some of these would mean that your combs were full of atypically colored honey, while others would indicate that they held another substance altogether.

It is possible that the bees have been attracted to an artificial food source containing dye which is producing this green honey. In that case, it would not really be honey at all. A similar tinted "honey" story was reported last fall in France and was widely circulated in the news media and over the internet. What the French bees produced – definitely not honey – was blue and green and was determined to be the result of colored syrup collected by the bees at a nearby M & M factory. Whether the comb was also M & M colored, and whether it would melt in your mouth but not on your hands, was not reported. In 2010 the New York Times reported that a Brooklyn beekeeper was seeing red honey in her hives. In this case the comb was of a similar hue. It seems that her bees were foraging at a Maraschino cherry plant and collecting cherry juice. Maraschino cherries contain extra sugar, and red dye is added in processing to give them that mouthwatering red color which looks so luscious on top of ice cream sundaes. No matter how appetizing they may be in candy and candied fruit, sugar syrup or dyes in the harvest from a hive do not meet the definition of honey.

It is possible though, for tinted honey to be produced by bees from pure, natural nectar. Purple honey has sometimes been reported in the eastern United Sates which some beekeepers attribute to blueberry, cotton, soybean or kudzu nectar. Researchers say soil rich in aluminum can cause a transfer of minute amounts of that element into sourwood nectar and cause a reaction which produces purple honey. However, these reports do not mention tinted comb. The color of beeswax can be affected by the color of the pollen the bees were eating when they produced the wax. A beekeeper in Kentucky contacted me a few years ago about blue comb and honey in one of his supers. Since he lived in a remote, rural area, he thought it unlikely that his bees were into an artificial food source. He did observe them working ironweed, and thinks that was what caused the unusual color.

Brightly colored pollen in comb. (photo by Mary Parnell Carney)

If what you extracted from your hives was the product of artificial food sources, that doesn't necessarily mean that it is inedible. It does mean that it isn't honey. Unless you were able to identify the source, you couldn't honestly offer it for sale as honey, but considering the small size of your harvest, that probably wasn't your intention anyway.

A beekeeper in Indiana asks:

Last Fall my bees worked hard on the copious White Snakeroot (Ageratina altissima) in my yard. That's the plant that caused the milk sickness that killed Lincoln's mother (and many others), when cattle ate the plant, and its toxin got into milk. I'm assuming I don't have to worry about my honey, but do you know anything about this? The plant used to have the name Eupatorium rugosum until the splitters changed it.

Thanks for any advice.

Phil replies:

There are some plants whose nectar produces a honey which will sicken people without harming the bees. Historical references tell us that Roman troops attacking Turkey in the first century were incapacitated by ingesting honey from the nectar of a local species of Rhododendron. The North American plant most commonly cited as a source of toxic honey, along with some of its relatives in the heath family, is mountain laurel. Rhododendrons belong to the same family, and honey from the plants has a reputation for being poisonous. However, John Lovell's *Honey Plants of North America*, states that honey bees do not work rhododendron blooms in the United States. Both mountain laurel and rhododendron are evergreen shrubs which bear beautiful flowers in the Spring and Summer in the mountains of my native Appalachia, but I have never heard of anyone's becoming sick from eating honey produced during their blooming season. It may be that bees do not work the flowers of either plant, or that what they do collect from them is too diluted with nectar from other sources to cause any ill effects.

White snakeroot is a wildflower which is common in woods and thickets throughout the eastern United States. It contains a chemical called tremetol which, when eaten by livestock, make them sick – sometimes fatally. The toxin can be passed on to humans in meat and, more commonly, in milk. Traditionally, tremetol poisoning is known as milk sickness. Though it is rare today, it used to be a more common affliction and an outbreak of it in 1818 is responsible for the death of Nancy Hanks Lincoln. However, I can find no reference citing harmful effects of honey produced from the blooms of *Ageratina altissima*. I also consulted my friend and fellow beekeeper Randolph Richards, who is more of a honey plant expert than I am. He, too, is unaware of any instance of a person's becoming sick from honey derived from white snakeroot plants. While researching the answer to your question, I became curious and compared the picture and description in my *Audubon Society Field Guide to North American Wildflowers* to some weeds which have been growing in my beeyard for the last 15 years and which I had never bothered to identify. Let's just say that I think you can rest assured and enjoy your honey without fear of suffering ill effects.

Blooms of white snakeroot. (photo by Phil Craft)

A beekeeper from Kentucky writes:

I had a hive that was weak enough that the wax moths took it over. Most of the brood frames were full of honey and comb. I removed all of the frames from the hive and froze them, and they are still frozen. My question is, can I reuse these frames, even with the moth junk in them???? AND will the bees clean up the mess and use the honey in the frames?

This is probably a DUMB question, but I don't know what to expect if I go ahead and use the frames.

Phil replies:

If the comb is generally in good condition, you can just put the frames back in the hive as is. (Let them warm up to the outside temperature first.) The bees will clean up damaged cells, rebuild the wax comb and re-use them. They will also make use of any honey remaining in the affected frames. You can be assured that any wax moth larvae, pupae, and eggs are dead and will do no further damage. (Even freezing overnight will do the job.) In the Spring, you can put these frames into an existing hive, a new nuc, or a hive with a new package of bees or a captured swarm. I normally discard frames in which more than 20 percent of the comb is badly damaged. Any frames which don't contain enough good comb to be salvaged can be scraped clean. That is the only preparation required before adding new foundation and putting them back into a hive.

A beekeeper from the Midwest asks:

When you extract honey and pass it through a strainer, you can sell it as raw honey. What is not-raw honey called?

Phil's reply:

First, let's consider what is meant by raw honey. There is no definitive or legal definition for "raw honey." I consider virtually all honey sold by local beekeepers as qualifiying. Some people may think of the term as applying only to honey which is unfiltered (no filtering or straining at all), and unheated during extraction and bottling. To others, honey is raw if it has undergone only minimal processing - but that is another subjective term.

What raw honey is definitely not is honey that has been subjected to extreme filtering – the process of flash heating and pressure filtering through micro filters which is used by most large honey packers in order to reduce crystallization on the shelf. Such filtering is designed to remove very fine particles in the honey, including pollen grains, around which crystals might form. Heat aids the filtering process and melts any crystals already formed, even those so small that they are invisible to the eye.

The filtering that most small scale beekeepers do to remove bits of wax, bees' wings, and other non-honey particulates that have ended up in the honey during the course of removal and extraction, is not even remotely similar to the industrial process. The temperatures to which small beekeepers heat their honey (when they use heat at all) are also very different from those used by large commercial bottlers. I usually heat mine in a jacketed bottling tank to 100°Fahrenheit to improve its flow during bottling. It saves a lot of time, especially when I'm filling quart jars. However, a temperature of 100° is no than honey can reach in the hive in hot climates, and it will not degrade or alter the taste. A lot of commercial honey, on the other hand, is heated to between 150 and 170 degrees – temperatures which may affect both color and flavor. In comparison, I think the typical consumer would consider the honey produced by virtually all local beekeepers to be raw.

To answer your question directly, the term for not-raw honey is processed honey. However, because the word "processed" conjures up images of commercial pressure filtering, flash heating, and bland taste, you could just say "honey" or "extracted honey." No need to say "non-raw" or "minimally processed." I think you could label it and refer to it as raw honey if you wish, as long as it has not been pressure filtered or heated much above ambient Summer temperatures. Though I do not put "raw honey" on my labels, when asked, I describe my extraction and bottling process and say that I consider the result to be raw honey. BC

Phil served as the KY Dept. of Agriculture's State Apiarist from 1999 through 2011. He is a graduate of Oberlin College in OH and the University of KY. A native of the mountains of Eastern KY, he now lives out in the sticks in the Bluegrass Region of KY near Lexington with his family, a very old dog, and some beehives.

BIGGER PICTURE

Planning For The Spring

Jessica **Lawrence**

Now, in these cold Winter months, some people begin to wonder if we will ever see warm weather again. Some people barely notice the passing of the seasons, or live in areas that don't ever really get cold. Then, there are the people who put on their coveralls and work frantically to try to get everything done before Spring.

My personal goal for beekeeping is to have over 100 hives in the next two years. For some of you, that is nothing – and for some of you, that is a huge number. For me, it is the maximum number of hives that I can maintain without going crazy. For my Winter months, this means I have to buy my Spring equipment, paint it all (in different colors, of course. No doing it the "easy" way with a five gallon bucket of white paint), have my frames ready and keep wax moths out of my stored comb. I am not a fan of cold temperatures, so I always have to bring the pieces in and out of the living room so I can paint next to the woodstove. The fun part is scraping the paint off the floor when I forget to put a tarp down – I am a messy painter. Sometimes I even get it on my supers, but mostly myself and everything else.

Another big workload for the Spring preparation is the garden planner. I have an entire wishlist on Amazon.com just for seeds! Johnny's is my favorite, followed by High Mowing Seeds. I'm sure that some of you guys have the same problem that I have – a bigger dream than my reality of gardening space and time. I have spent almost 70 days traveling for work in 2012, so I have to keep in mind that I won't always be available to take care of all of my projects. I try to limit ("try" being the operative word here) my seed choices into three categories:

Garden Food that I KNOW I like (and grows well in my area)

Garden Food that I want to try for the year (my experimental varieties)

Flowers that the bees like (all bees, not just honey bees!)

With that in mind, I usually have to rein in my tomato seed purchases, as they are my favorite garden plant ever. I have an addiction to the Nightshade family of plants (I am from the South, so it is tobacco country) and they grow well with our hot southern summers. Normally, I choose a staple of tomatoes (one new variety each year, I had Black Krim this year and it's probably not coming back), cucumbers and leafy greens (Shanghai Pac Choy is a favorite of mine), with a smaller selection of other vegetables and melons. I have had a lot of success with my raised bed gardening these past two years, but they just weren't big enough for all of my seed needs. I have been playing with different raised bed designs, and I talked my mom into trying one out. My grandpa and cousin came to her house one day, and made the first one off of my "blueprints" which is to say, they are very imaginative. Because my family is awesome, they also built an additional three beds for me, so I only had to bring them home, dig the post holes, and fill them up! If you are curious, I use a combination of organic garden soil, organic compost (purchased), my own compost and some top soil. I also line the bottom of the beds with cardboard (from my hoarding problem of Diet Pepsi cartons) so that eventually it will make happy soil underneath, I'll attract earthworms and I don't have to worry about grass from the bottom. I will add some of my vermicompost (worms and all) to add to the biodiversity, but not until I plant my seeds/transplants, so that it's warm enough for my wiggler friends. Right now it's covered in another layer of cardboard, with straw on top of that.

I wanted my beds in a tiered system, so that I could plant my vining crops in the highest box (tomatoes, beans, cucumbers) with a trellis of some sort, and put non-vining plants in that same box (like my Carnival carrots with my Beefsteak tomatoes) with a lower tier on each side to house my turnips, lettuce, peppers, ect. I wanted my beds over a foot off the ground (mine are 16 inches on the low tier) so I don't have to bend over so far, and also as a deterrent to creatures. A bit of chicken wire pushed into the edge of the soil keeps most mammals out of the boxes, but still lets the bees through and can be easily removed if necessary. Since I am constantly "stealing" from this system, I always add back fertilizer when I pull up a plant. If I harvest spinach or lettuce, I will add an

A forager collecting pollen from buckwheat.

My original "blueprint" for the raised beds.

The finished product with Pa Harvey and my cousin Michael, and my sister Lady.

A bumble bee collecting pollen from the asters.

inch of compost to that area, since the soil didn't get to "eat" its produce. Planting those sorts of crops should be staggered, because you really aren't going to eat 10 heads of lettuce at once. When I take the time to keep up with it, I'll plant something like three lettuce plants, 10 pac choy and five spinach every seven to 10 days. If it's something I can use en masse (like canning it, or making a big pot of soup) I'll plant a bigger crop. Turnip greens are one of my favorite foods, so I can plant a lot of turnips at once and can the greens. I don't want to waste any food if I'm going to take the time to care for it. If you are growing your own food, it gives you a better appreciation for the effort to grow it than buying your produce at the grocery store. I am much more likely to let grocery store produce go to waste than I am something out of my own garden. Really, though – nothing goes to waste at home. There is always *something* that will eat *anything*. It's a very convenient cycle.

For my bee flowers, you might think that I cater only to my honey girls, which is not true. I make sure that I can bring in a diverse crowd of pollinators, particularly native bee species. I love all bees, and I also like having a productive garden. I know I have more bees than forage in my area, so I am not worried about having them skip my garden in favor of other treats. I am trying to attract and populate beneficial insects to my farm, and there's nothing like biodiversity to help with this. I can't tell you what an increase I have seen in insect species in the past three years. If you ever see my house, it might not look like a lot, but there's been a lot of planning and work into creating a space that is a haven for pollinators. I like having multi-species attractive plants, but sometimes, it doesn't work that way. Bumble bees love my Canna lilies, and they always have pollen baskets crawling on the asters. I plant a lot of bulbs that don't do a lot for the honey bees, but attract other insects. The honey bees will collect pollen from my ginger and from my Datura flowers, sometimes going so far as to wedge into the unopened flowers before sunset (Datura opens at night), and pulling out baskets of gray pollen. If there's henbit in my yard, I refuse to mow until the weeds are higher than the henbit. When I plant on purpose, I do use a tiller (sorry to all you no-till people, I know some of you are out there reading this!) and throw in a good mix of chicken poop and compost. I start a batch of hairy vetch in the Fall, which will be massive by mid-Spring, and it gets tilled back into the ground when I'm done with it. Buckwheat and mustard get planted in strips around my fruit trees, along with sweet clover, sweet pea, mammoth clover, alsike clover and crimson clover. I am hoping to one day never have to mow again due to the takeover of the clovers. Who needs grass?

Buckwheat is one of my all-time favorite bee plants. Besides being pretty, the girls absolutely love it, and the honey is like molasses. It is not a favorite of mine, but there is a never-ending market for buckwheat honey. Also, if you let it seed, you can just till it under and it will come back again. We had four crops of buckwheat this year, all from one planting. It is fairly drought tolerant – basically, one rain to come up and one to bloom. It has a pretty quick turn-around, and a long bloom period (I think ours was around two weeks or so, sometimes longer). I have planted it successfully for my bees both in central North Carolina and at our farm in the mountains of NC. This is excellent for succession planting, because you can keep buckwheat blooming for the entire Summer if you plan properly. It needs some care in the Spring, though, because it does not like cold weather. It has to be planted past the last frost date. If you are a super-homesteader, and you mill your own flour, buckwheat pancakes are pretty good. I also think buckwheat noodles are excellent – I had them for the first time in the Shrimp & Soba Noodle Salad at Panera Bread in California. I was very disappointed that it didn't make it all the way to the east coast. If I get around to that sort of homesteadery, I will be attempting soba noodles. I'm just not sure if you can make them with the American species of buckwheat, but I'm sure I will find out! BC

Jessica Lawrence is a Research Entomologist for Eurofins Scientific, an avid gardener, beekeeper and tattoo collector.

Support Your Local Beekeepers – Make Mead

Jack **Blackford**

Where Are Our bees?

A few years ago me and my wife Toni were walking around our wineyard and noticed we did not have any bees working the apple trees. We later searched the black raspberries, no bees, none on the blackberries or currants either. Even the white clover in our yard didn't have any bees. We had to fix this if we wanted a productive wineyard the next Spring. We did what everyone with a problem does nowadays, we Googled. We found the West Virginia Eastern Panhandle Beekeepers Association (WVEPBA, www.wvepba.org) and they introduced us to a commercial beekeeper Herb, at Eversweet Apiaries, who needed room to expand his colonies. We had the perfect place for that, we don't use insecticides so it's a great place to be a bee. We also have a wide variety of bushes, brambles and fruit trees in our wineyard to make wine from what bees love.

Soon our wineyard was full of bees busy finding every apple blossom. Later in Spring we could easily see the difference in the amount of fruit and the quality of the apples from having plenty of bees to pollinate. The bees also loved our black raspberries and blackberries. Surprisingly they also really liked to get pollen from our asparagus patch (not for wine!).

The Mead Bug

It seems like more than a decade ago we made our first mead with store bought clover honey. It was satisfactory, but we were a little disappointed in it and thought we could do better. We then learned about melomels and made a blackberry melomel with store bought clover honey. Again it was ok but we were disappointed at the light fruit flavor that was advised in most of the recipes we found and the lack of taste from the honey. So we basically thought meads were just not our thing and concentrated on making country wines with as high a fruit content as we could squeeze into the must and still keep things in balance.

The mead bug bit again in 2008, we had a bumper crop of elderberries and had made several different kinds of elderberry wine and decided it was time to try our hand at an elderberry melomel. At the WV Mountain Heritage Arts and Crafts Festival we found a vendor who sold honey from up in the mountains of WV. They had a a nice clover honey, it tasted better than the stuff we got at the supermarket so we bought a gallon. We liked using 100% juice in our wines, for this wine we steamed 50 pounds of cultivated elderberries to yield five gallons of juice, we added our gallon of clover honey, nutrients and pectinase. We also added oakmor to give it an extra layer of oak flavor. We aged it for a year in a glass carboy. It had a rich elderberry flavor but the honey did not shine through as much as we wanted. We still thought the mead was exceptional, and the wine taste testers at the Flying Barrel (**www.flyingbarrel.com**), our local home brewing supply shop, encouraged us to enter a winemaking contest. We wanted to see how we could improve on our mead so we entered it into the Wine Making Magazine Amateur Winemaking competition in 2010

One of our first year hives making honey on foundationless frames in our Wine-

and were very happy to receive a gold medal along with suggestions on how to improve our next batch.

We Found Our Local Beekeepers Association

In 2010, after being introduced to the good folks of the WVEPBA, we learned more about varietal honeys. I had always thought honey was honey but was I ever wrong. Our area produces several distinctive honey flows. After the dandelions start to bloom the locust trees begin to bloom. The bees really like our farm's locust trees and if you stand under one on a warm day it can sound like a helicopter hovering. Locust honey is light colored and

We crush the comb ad then strain the honey out. This helps preserve the smell of the flowers in the honey.

We use a wine-press to fully extract all the honey from the crushed combs, a significant amount of honey can be extracted if the combs are crushed in a press.

clear and tastes so much better than grocery store honey. The next big flow is from the tulip poplar trees. Our poplars produce a darker honey with a very rich flavor much more intense than the average honey. Next the wildflowers start to bloom and this honey is different every year, like different wine vintage years. One year thistles might be having a good year and contribute more to the wildflower honey than they did the year before and so the taste changes every year. The next season there may be more milkweed contributing to the honey and once again the flavor changes. I suggest that beekeepers may want to save some honey yearly and sell it as vintage year honey as another unique product that consumers attention.

Our Honey Education Begins

This is when our honey education really began. Now we had bees in our wineyard to pollinate all our different fruits and we could use our local honey and make a much better melomel using the very same fruit the bees pollinated. Our goal was to try different local honey varietals and adapt our standard berry fruits to melomels. In 2011 our standard black raspberry wine, without honey, took a gold medal, so we already had a good black raspberry recipe. We wanted to use the same recipe, substituting honey for any added sugar to make our melomel. We had a great black raspberry year with big juicy berries full of flavor. In 2010 we bought a five gallon bucket of local tulip poplar honey from Eversweet Apiaries. We knew the tulip poplar honey would match perfectly with the big taste of black raspberries. We simply added honey instead of sugar and used our hydrometer to measure how sweet the must was after the honey was added.

Black Raspberry Mead

24 lb Black Raspberry
10 lb Elderberries
12 lb Raw Strained Tulip Poplar Honey at start
5 tsp Fermaid Yeast Nutrient
15 grams Fermocel Nutrient for second feeding
1 tsp Pectinase
¼ tsp Potassium Metabisulfite
55 grams Oakmor Toasted

The black raspberries were frozen immediately after picking. To make wine, they were then thawed overnight. The next morning the berries are crushed in a grape crusher, then metabisulfite and pectinase was added and held overnight at room temperature. Ten pounds of eldeberries were steam juiced to yield a gallon of juice and the honey was dissolved in the warm juice. The black raspberries were then pressed and the pulp discarded, yielding about 2.5 gallons of juice. The juices were combined, the oak powder added and specific gravity (s.g.) adjusted with more honey to 1.11 and then inoculated with Red Star Pasteur Red yeast. As the s.g. reached 1.035, 15 grams of Fermocel P was added to boost the fermentation and avoid any sluggishness. As the gravity dropped to 1.01 the wine was transfered to a carboy and topped off with more tulip poplar honey to s.g. 1.014. After several rackings and bulk aging for a year the wine was vacuum degassed, and more tulip poplar honey was added to increase the final sweetness to s.g. 1.038 along with sorbate to inhibit any further fermentation. The WMM competition judges agreed with our efforts and we were awarded another gold in 2011.

On New Year's Day in 2011 we decided to use up the last of our tulip poplar honey and make a dried elderberry mead. We dried home-grown elderberries which adds a richer deeper taste, like the difference between raisins and fresh grapes.

Dried Elderberry Mead

35 ounces of Dried Elderberries
12 pounds of Tulip Poplar Honey at Start
5 tsp Fermaid
15 gram Fermocel P for second feeding
10 ml Pectinase
55 grams Oakmor Toasted in Primary
10 grams Kwik Bentonite in Primary

Black raspberries in a grape crusher over a 10 gallon Brute food grade container. Crushing helps release the fruit and makes it easier for the pectinase to digest and gives more accurate readings on the acidity and specific gravity of the fruit.

¼ tsp Potassium Metabisulfite
93 gram Acid Blend

The dried elderberries were added to two gallons of water and brought to a boil and then simmered gently for 20 minutes. After the juice cooled, the berries were pressed and the pulp discarded. The tulip poplar honey was dissolved in the juice and the specific gravity was adjusted to 1.100 with more honey. K1-V1116 yeast was used to provide a strong fermentation. After the gravity dropped to 1.05 the Fermocel P was added to support further fermentation. When the gravity dropped again more honey was added to raise the gravity to 1.024 in the secondary carboy. The yeast dropped the gravity down to 1.010 and it was bulk aged for 10 more months. The mead was back sweetened to 1.030 with locust honey to give more nose and a bold honey taste to match the elderberries, along with sorbate to stop any further fermentation and metabisulfite to prevent oxidation. We entered this into the WMM 2012 competition and we earned another gold.

Be Nice to Your Honey

We learned a lot about making mead and raising bees in the last couple of years. One thing we learned was to never boil the honey, it is actually better to not heat the honey at all. The bees have worked hard to make the honey perfect, why drive the delicate varietal flavors away with heat? A good drill mounted stirrer or a big spoon will easily dissolve honey into the must. If you want to clear your mead adding bentonite at the beginning takes out some of the protein that can cause a haze. We also like to use SuperKleer after back sweetening with honey so that any protein introduced during sweetening is removed before bottling.

These easy meads don't take years to be drinkable as some winemakers claim. We typically bulk age for a year and then the meads are smooth with deep flavors of both the fruit and honey. Making country wines at home has led us to establish our own wineyard. Making melomels with our own fruit further encouraged us to raise our own bees. In the Spring of 2012 we established our own hives. This

Fruit can be crushed with a great big potato masher. We use this to stir the must when adding each ingredient like yeast nutrient.

first establishment year only yielded three gallons of honey from one hive. It was gathered throughout all the honey flows so we are going to call it wildflower. This first harvest of honey is special to us so we have been debating what kind of mead to make with our first homegrown honey, the votes seem to favor black raspberry again. I think our homegrown berries and our homegrown honey are going to pair together very well. Our current batches of mead are being made with Locust honey. Of course there is a black raspberry, and even a black raspberry and blackberry mix mead and a plum mead. We also got our hands on a gallon of thistle honey and paired it with 50 pounds of strawberries from Sams Club. Matching up different fruits to varietal honey is a lot of fun.

This year we also grew an acre of buckwheat planted in July to help carry our bees through the nectar and pollen dearth we usually experience here in the Mid-Atlantic area in the Summer. The bees loved the buckwheat and we let them keep it all this year to help build up for the winter. Next year we plan on growing more buckwheat for a honey flow and harvesting it for mead. Many people are like we were several years ago thinking honey is just honey and that what you bought at the supermarket was the good stuff. We were awakened to how different varietal honey can be when we first tasted buckwheat honey. It is so dark it is almost black like molasses, it has such a deep flavor that you would never expect a honey to have. When we get our first buckwheat honey we are actually going to have

Last season's Black Raspberry Mead bulk in a glass carboy with a three-piece fermentation lock on top. We cover our carboys with a paper grocery bag while aging to protect the wine from the lights.

to be careful how much honey we add for the first time so it doesn't overpower our fruit. I am thinking a dried elderberry with lots of berries and a big black raspberry with a few more berries than we typically use will match up perfectly with the power of a buckwheat mead. I am not sure if we will enter this in any competitions, it might just be too good to spare. BC

Jack Blackford and his wife, Toni, enjoy keeping bees and making wine in West Virginia.

HIVE BEETLE REVIEW

Beekeepers need to know how beetles slime their hives and what conditions are most dangerous to their hives.

Jerry **Freeman**

BACKGROUND

Five or six years ago some of my retired buddies decided to get a few beehives. Knowing I had kept bees and raised queens, they came to me saying, 'Freeman our bees are dying! What's wrong?' I had been away from beekeeping a long time and had not kept up with what was happening to the bees. I had heard of *Varroa* mites but knew nothing about them. When we looked at their few surviving hives, I was astounded to see hundreds of little black bugs running everywhere. That was my introduction to hive beetles.

I set up two small hives in my backyard to study and printed out stacks of the latest research on the internet. For whatever reason, our area in SE Arkansas has a really heavy infestation of hive beetles.

A lot of people in the beekeeping industry were working hard to come up with an effective way to control the beetles. I bought every trap and chemical available and tested them on my hives. All the traps and chemicals killed a few beetles, but not nearly enough to keep them from killing the hives.

From studying what others had done and observing bees and beetle behavior in the hives, I developed the concepts and a rough prototype for an effective beetle trap. From there, my buddy, Clyde Hammil, worked out the construction design.

This article is not so much about traps or chemicals, but a summary of what I've learned about SHB the last four or five years. Some of the common recommendations for hive beetle control ***do not*** stop the beetles from sliming or killing your hives. Beekeepers need to know how beetles slime their hives and what conditions are most dangerous to their hives.

HIVE BEETLE LIFE CYCLE

There is a lot of variation in the length of time it takes beetle eggs to hatch and the larvae to pupate, depending upon the temperature and humidity. There is also variation in the size of beetles depending upon the amount and quality of food available to the larvae. Small hive beetles are not 'young' beetles; they are just small because they were not well fed.

1. Adult beetles mate
2. Female beetles lay eggs
3. Eggs hatch (one and a half days to six days)
4. Larvae crawl through the hive eating pollen and bee brood for protein (everything else, too!)
5. ***The larvae defecate or 'poop' almost continuously as they eat their way through the combs.*** This is what destroys a hive.
6. The feces or 'poop' generates yeast that ferments the honey.
7. Gas bubbles from the fermentation swells the honey and it runs out of the combs. Honey can even run out the front of the hive! It smells bad and the combs are covered with 'slime'.
8. After about 10 days, the larvae mature, and then move to the front of the hive and drop to the ground .
9. They bore into the ground a few inches and pupate into adult beetles. If they cannot bore into the ground below the hive, researchers claim they can crawl over a 100 feet to find suitable ground.
10. Hive beetles have difficulty pupating when the ground temperature is less that 70° F. That's why beetle populations usually don't explode until summer. High humidity and high ground temperature is why we have so many beetles in the south.

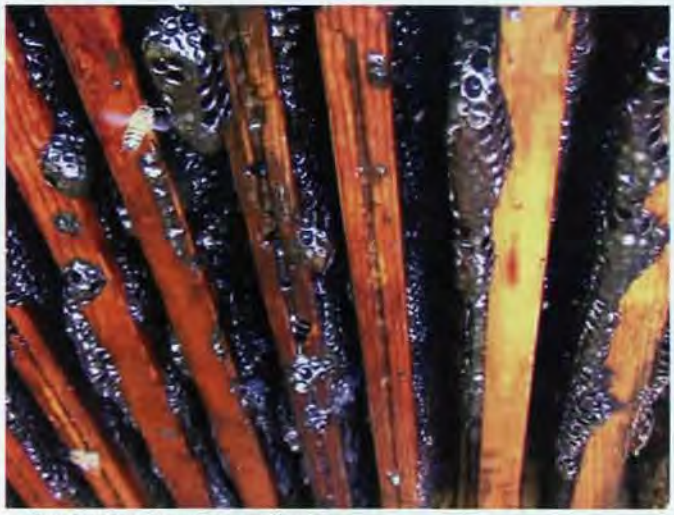
COMMON SUGGESTIONS

One of the first things you will hear is to keep your hives in full sun. That is absolutely true and will reduce the beetle population in the hive. It will ***not*** keep the beetles from killing or sliming your hive.

I hear quite a bit about using ground drenches, nematodes and beetle traps outside the hive. All these are helpful in reducing the beetle population ***in the area***, but they do nothing to protect your hives. See #8 in the Life Cycle list. The beetle larvae do all the damage to the hive and they are mature before they drop to the ground. The larvae have already ruined the hive ***before*** they drop to the ground. Any treatment on the ground or outside the hive is too late. For real protection, we have to ***kill the adult beetles in the hive*** so they don't lay eggs or produce a significant number of larvae.

Another thing we often hear is that a strong hive will take care of the beetles. That is only half true. When I

Honey running out.



Combs that have been slimed.

Bottom board under slimed combs.

first started studying hive beetle control, I saw hives that seemed to be thriving even with hundreds (thousands?) of adult beetles. Adult beetles do not destroy a hive. Dr. Collison (retired, MS State) explained that the bees in a 'strong' hive will herd the beetles into groups and keep them in 'jail'. The beetles do not lay eggs or the eggs are carried out by the bees. Either way, only an occasional larva is produced. (See #2 & #3 in the beetle life cycle.) ***Remember, it is the larvae that cause all the damage to our hives!!*** No larvae – no significant damage.

Our standard perception of a 'strong' hive usually works OK with up to two deep hive bodies. (Usually, not always!) When we open a hive for inspection, the smoke, daylight and confusion allows the beetles to 'break out of jail' and run through the hive. A 'strong' colony has enough ***bees per frame*** to chase the beetles, herd them back into groups and keep them 'in jail'. For a colony to be able to do this, ***bees must cover 80% of every frame!!*** Otherwise, the beetles will lay thousands of eggs, larvae will be produced, the hive will be ruined and the bees may even abscond.

Definite problems arise when we add honey supers. A queen can only produce enough brood for the bees to cover 80% of all the frames in two deep hive bodies and maybe one medium super. What if you have two or three supers? There's a good chance a strong colony will have the beetles 'in jail' and little or no damage will be done. What if you open the hive to check the supers and find the honey is not capped and you put the supers back on? ***Trouble!!***

HIVE BEETLE NIGHTMARE – This actually happened to me!

Sat AM:
- Checked top super – 70% capped
- Checked second super – 50% capped
- Saw a few beetles (Didn't realize most were in 'jail'!)
- Put the hive back together for the bees to finish capping the honey

UNKNOWN TO ME
- o Beetles made a 'jail break'
- o Beetles immediately laid eggs everywhere
- o Bees were unable to herd them back into groups

Sun PM:
- Beetle eggs began to hatch into larvae (Hot, humid weather allows quick hatching)
- Larvae began eating and 'pooping'

Wed PM:
- Yeast began to ferment the honey

Fri PM:
- Honey swelled and began to run out of the combs

Sat AM:
- Found wet honey on the top bars and throughout the hive. Many frames were slimed.
- I was sad, sick, confused and wanted to cry.

Too much sugar, but it worked!

SOLUTION - REDUCE THE SIZE OF THE HIVE!

Female beetles can lay 300 or 400 eggs per day. It only takes a dozen or so females to produce enough larvae to ruin a hive. If you open a hive that has beetles, reduce the size of the hive so that each frame is 80% covered with bees. For a small hive, that may be one hive body. Strong hives can usually protect two deeps and maybe one medium. ***During the honey flow, there are too many frames for the bees to protect from hive beetles!*** To reduce the size of the hive, capped honey can be extracted, other frames can be brushed free of bees and put on hives that don't have beetles or the frames can be stored in a freezer until they can be returned to the hive.

This does not mean you should not open your hives during the honey flow. There are times when we see indications at the front of the hive that something is wrong inside. That may be dead bees or larvae on the ground, very low traffic at the entrance when it should be heavy. We have no choice but to open the hive for inspection no matter how many supers are on it. ***If you have hive beetles, have a plan in mind as to how you will reduce the size of the hive before you open it.***

Some areas in the South have so many beetles that it's not possible to protect your hives without a good trap. (Of course, I use my own beetle trap.) Some of the inside hive traps recommend using an attractant. It seems to me that bee brood and pollen (protein) are the most effective attractants to beetles and larvae. Other than from occasional curiosity, I've never seen beetles enter a trap *except when the bees were chasing them.* Beetles do not like being harassed so they are attracted to weaker hives with gentle bees.

If you don't have a lot of beetles,

* Keep your hives in full sun
* Keep strong hives with aggressive bees
* Plan to reduce the size of the hive if necessary

As I said earlier, we have a lot of beetles in our area so traps are necessary. Still, I keep my hives in the shade with very gentle bees. Since I study honey bees and queen rearing, most of my hives are less than strong. We are forced to leave traps on our hives year round.

When developing the trap, the two concepts that that showed the most promise were using a screened bottom board and an oil tray underneath the screen. I soon learned that the screen and the oil tray had to be full width and length of the hive body with no ledges anywhere for the beetles to run on. We made and installed the traps on my buddies' hives and they haven't lost a hive to beetles since.

I discovered the powdered sugar treatment works for hive beetles while dusting for *Varroa* mites. When we would go through a neglected hive, we always installed a beetle trap and sugar dusted to get an idea of the mite population. Every time we did that, we got an oil tray full of beetles.

Later, I discovered that my gentle bees don't always chase the beetles vigorously enough to run them out of the hive into the oil tray. If I see a few beetles, I sprinkle powdered sugar between all the frames. That irritates the bees (makes them aggressive) and they chase everything – me and the dog as well as beetles!

SUMMARY

1. To protect our hives, ***adult beetles must be killed inside the hive*** to prevent the production of larvae. Any treatment outside the hive helps reduce the area population of beetles.
2. For areas with heavy beetle infestations, the most effective trap design uses a full width and length screened bottom board with no ledges and a full length and width oil tray under the screen. Note: If there are spaces around the oil tray, the beetles will lay eggs and raise larvae. This will produce more beetles than the tray is killing.
3. ***Be prepared to reduce the size of the hive*** anytime you open it so there are enough bees per frame to control the beetles.
4. If you have gentle bees or keep your hives in the shade, sugar dusting every five or six weeks will provoke the bees into chasing the beetle more aggressively.

These actions have eliminated hive beetle damage to our hives even though we have a lot of beetles. BC

Jerry Freeman 870-853-2412 http://www.freemanbeetle-trap.com/

WINTER PROJECTS

Use Those Winter Months To Get Ready For Spring - Here Are A Couple Of Projects To Get You Started.

Ed **Simon**

Build A Multiple Frame Jig

Frames are needed by the tens and hundreds or even thousands. A jig to ensure alignment is almost required when working with thin and light pieces of wood. It saves an unbelievable amount of time when you have to produce large numbers of the same item with consistency. Unlike the single frame jig, this jig will allow you to build 10 to 20 or more frames at one time.

Parts (Thickness x Width x Length)

1. ¾" x 4½" x 12¾" – End plate (2)
2. ¾" x 4½" x 15⅜"– Side plate (2)
3. ¾" x 4½" x 7" – Hinge plate (2)
4. 1½" x 9¼" x 15" – Pressure plate (2)
5. 2" x ¼" – Carriage bolts (6)
6. Hinges (2)
7. Tension spring - Stretch to 20" (1)

Disclaimer

Due to the wide variety of wooden frames available, the dimensions provided are the ones used by the author. They should be close enough to be used for any manufacture's wooden frame. But to be on the safe side, check them before cutting the parts.

Construction

This frame jig consists of three pieces. The first is a box that fits inside the frames. This is built to fit very snuggly inside the frames and keep the ends square while gluing and nailing them to the frames. The second two pieces are hinged doors that keep the frames solidly positioned (clamped) against the inner box.

The dimensions provided in the parts list are for a jig that will allow you to assemble ten medium or large frames at a time. To increase this number you have to make parts #1 and parts #4 a different length.

Step 1: Cut parts #1, #2, #3 and #4

Before cutting the side plates (part #2), measure the distance between the end bar grooves cut in a top bar. This measurement minus 1 ½" will be the length of the side plate.

The length of the end plates is the width of the number of frames you want to assemble when they are positioned for assembly plus ½".

Note: The end bars are positioned with every other one upside down. This allows the end bars to inter leave and keeps the bars straight.

The length of the pressure plates (part #4) is the length of the end plate plus two inches.

Step 2: Assemble the inner box

Warning: Before assembling the inner box, position a frame as it would be positioned on the box for assembly.

The frame must be able to be slid off the box. This may result in the need to shave a little off the length of the side plates.

Be sure the box's corners are a true 90 degrees by measuring the diagonals of the box. When finished your test frame should just be able to slide off the box.

Step 3: Add the hinge plates

Mark three positioning holes on the hinge plates (part #3). These holes will allow the hinge plate to be adjusted for different thickness end bars should the need arise.

The hinge plates are positioned on the sides of the box just so their ends cover the end bars. Check your positioning markings to make sure they will not cause problems when you mount them with the carriage bolts.

Drill ¼" holes where you marked the hinge plates. Then remove the plates and enlarge the holes on the plates (not the side plates) with a ½" drill. These larger holes will allow you to position the hinge plate for variations in the thickness of the frame end bars.

When you are finished drilling the holes, use the carriage bolts to secure the end plates to the inner box. The end of the hinge plate should just cover the end bars

Step 4: Mount the pressure plates

Using the hinges (part #6) mount the pressure plates to the hinge plates. They must be positioned to allow the pressure plate to swing away from the inner box. These hinges allow the plates to be released and will allow the frames to slide off the inner box.

Step 5: Add the tension spring

Attach one end of the tension spring (part #7) to a pressure plate at the opposite end from the hinge. A screw through a few of the end coils of the spring will do the trick.

Step 6: Add a tension spring latch or keeper

On the opposite pressure plate, drill a starting hole and pound in a 16d. nail. Leave ½" of the nail shank showing. Then cut the head off of the nail. A loop of the spring slips over this nail to keep the tension on the pressure plates.

Note: The nail should be on a slight angle away from the spring to keep it from slipping off.

Usage

To use the jig:

1) Attach the spring to its keeper.
2) Lay the jig on a flat surface.
3) Insert the end bars between the inner box and the pressure plate. Every other end bar should be turned upside down. This will keep the end bars aligned.
4) Put pressure on the end bars at the spring end and at the top of the jig to seat them.
5) Add glue to the slots in the end bars and add the top bar or the bottom bar as needed.
6) Nail or staple the exposed top or bottom to the end bars
7) Wipe the excess glue from the end bars
8) Flip the jig upside down, exposing the end bars at the opposite end
9) Reseat the end bars both vertically and horizontally
10) Put glue in the slots in the end bars and add the top bar or the bottom bar as needed.
11) Nail or staple the exposed top or bottom to the end bars
12) Wipe the excess glue from the end bars.

13) Release the spring from its keeper
14) Remove the frames and allow the glue to dry
15) Clean the excess glue from the jig.
16) Add additional nails/staples as needed

Warning: Failure to remove the frames from the jig before the glue dries may result in the frame being glued to the jig.

Note: Failure to clean the jig of excess glue will eventually cause the frames to be misaligned.

Conclusion

Once you get the rhythm of it, creating frames goes pretty fast. The jig can also be expanded very easily to accommodate more frames.

Gargoyles Are Useful And Free

Five years ago when I started building my own woodenware, I made a very unscientific survey. The question I asked was:

What is the most common problem when working with colonies of bees?

A few of the most common answers were:

1) Unable to find the queen
2) Propolis sticking to everything
3) Hive bodies rotting out – usually at the corners
4) Stings hurt

I was unable to do anything about problems one, two and four but I thought I might be able to help with the hive body rotting problem. At least it was related to woodenware. After watching a couple of the more experienced beekeepers examine a hive, it became apparent that problem number two – propolis – was also related to problem number three – wood rot. Being unable to get the hive bodies separated, a hive tool was usually inserted at a corner and forced between the hive bodies. Sometimes this worked but many times it required more force and the wood on the corner was torn or chipped. Since the hives bodies were usually reassembled in the same order the propolis built up and it required additional effort each time the hive was opened. Then I realized that the combination of damaging the corner wood with a hive tool and the subsequent rain water remaining in the corner accelerated the rotting of the wood.

The solution was an established architectural invention called a **gargoyle**. The Wikipedia definition of an architectural gargoyle is:

A **gargoyle** is a carved stone grotesque, usually made of granite, with a spout designed to convey water from a roof and away from the side of buildings thereby preventing rainwater from running down masonry walls and eroding the mortar between.

Therefore, let me introduce the **Hive Body Gargoyle**. It is a very simplified version of a gargoyle and is guaranteed to be free (just a little labor). Additionally, it will not scare young children when they see it.

It is the triangular shaped notch

that is removed from the top corners of a hive body. It is very simply made with a belt sander. Four corners can be formed in less than five seconds when you are building or reconditioning a hive body. This little notch provides two very important functions:

1) You can now get an initial purchase for your hive tool without chewing up the corner and
2) When water runs down the corner of a hive it is less likely to remain in the corner because of the slope and the width of the cut.

For a trial run, add the notches to a couple of your hive bodies and see if they make your life – well at least the hive inspection part – easier. BC

Ed Simon is a frequent contributor to Bee Culture *and is author of* Bee Equipment Essentials, *a book on how to build your own beekeeping equipment. It is available from Wicwas Press 1620 Miller Rd. Kalamazoo, MI 49001 or by emailing Ed at* ***OronocoHoney@PITel.Net****. This full color book provides all the dimensions and step by step instructions on how to create the basic beekeeping equipment.*

To Blog or Not To Blog

Does Your Bee Club or Bee Business Need A Blog!

Jessica **Dally**

For many beekeepers and beekeeping clubs setting up a blog was the first place they started with social media. But is a blog necessary for your club or beekeeping business and if so what do you need to know to have a successful blog?

Many have heard stories of people becoming quite wealthy with their blog, selling advertising or even turning their blog into a book deal. While this is certainly possible, for most beekeepers and clubs this probably isn't an appropriate goal. This type of blog writing requires a lot of time and effort and even then, nothing is guaranteed.

So why would a club or beekeeper want to write a blog at all? Blogs give you the ability to share longer stories and different content than you can share easily on Facebook or other forms of social media. Twitter, for example, has a 140 character limit. Good luck sharing a great story from your honey harvest with only 140 characters!

By writing a blog post and linking to it on twitter your great story now fits in the limited space allowed. For most, that is the point of a blog. It also allows you to share content with anyone on the web, not just who are on social media sites. It also allows you to update customers and club members without needing to constantly change your website.

What Blog?

The first consideration for any new blogger is what platform to use. If you already have a blog associated with your website you'll likely want to stick with what you have. If not there are several sites that can be used easily and for free.

Posterous

Many favor Posterous for its simplicity. Want to post an audio file or video link? Posterous makes this very easy and even allows you to post by email or from your smart phone without needing a bunch of technical skills.

The drawback to Posterous is that it's difficult to format your post so it looks good. You can't actually preview a post on Posterous so if that picture you posted shows up halfway off the page you don't know until you've actually posted the page on the web. It's live and now you have to go back and fix it. If you're concerned with the image you're creating for customers and followers this can be very time consuming.

WordPress

WordPress is currently the most popular blogging platform on the internet and many web pages use WordPress as both a blogging platform and a website. If you don't already have a website this might be an option to set up a blog and a website at the same time.

While the user interface is more complicated for WordPress, the options for customizing pages and content go far beyond the simplicity of Posterous. Because it's so popular there's a huge support community for WordPress which can be helpful if you run into a problem or question.

WordPress allows you to easily preview posts to change the layout, includes a great grammar and spelling checker and even allows you to schedule posts for the future. Maybe you're having a large sale but you're going to be in the honey house in the days before. Simply write your post a week (or a month or more!) before and schedule it to post when you want.

WordPress will also allow you to post from email or from an app on your smart phone. WordPress can be confusing to learn quickly but if you want more functionality you'll likely want to opt for the more robust and professional WordPress blogging platform. You can also host it yourself which means your content is stored wherever you want rather than on WordPress's servers.

Others

There are a number of other blogging platforms available each with its own benefits and drawbacks. Blogger, Tumbler and others all offer varying degrees of sophistication. If you want to keep things simple, you already have a website and customizing a blog to match your brand isn't important consider sticking to the more simplistic platforms. If you don't have a website or want a blog you can customize to match your brand, opt for WordPress. Either way choose a platform that has been around for a while and has a strong backing. You don't want to lose your work simply because the blog company you're using shuts down. Further a good blogging platform will likely take good backups of your work. If a smaller site crashes you might just lose your work for good.

Tools Your Blog Will Need

Whatever platform you choose there are a few simple things that any blog can and should have. Some of

Tags

Agriculture Associations
Beekeeping Bees
Books Brooklyn Dead Hive disease DVD
Education Fall Feeding Forums Foundation
Frames Garden Gardening Gear harvest
Hive Boxes Hive Death honey
Inspection installing Laws Location
Meet Up package pesticides Pests
Pictures plants Queen Spring
starting Sugar Summer Super
Supers Swarm Urban Beekeeping Veil
video waggle dance Winter

these will make things easier for your fans and others help you.

Subscribe by email- blogs are often followed by those who don't have a Facebook page or a Twitter account. They might not have be familiar with blog reading platforms so why not make it easy for them by having your blog send an email when you create a new post? Most platforms allow this type of subscription though some require that you add on a tool to make this possible.

Tagging posts- tagging is simply a way to add key words to a blog post to make them easier to find again. Maybe you write regularly about topics for new beekeepers. When you add tags it makes it simple to find these posts again and it makes it easier for your customers to find a topic they're interested in. While many bloggers don't tag posts, doing so allows you to answer questions from clients without having to rewrite content again and again. This feature will likely be more useful than you could ever imagine. Just think how annoying it would be to go through every post to find that great Fall 2012 harvest picture two years from now. But with a tag of "Fall 2012 Harvest" the time you spend scrolling through old posts will be significantly minimized. It can also help you review differences in your apiary or with your club year to year.

Links- your blog should have all the other places people can find you easily displayed. A link to your Facebook page, your Twitter account and your website are essential. A potential client might wind up on your blog without first going to your website. It would be a shame if they couldn't learn how to purchase your product simply because they didn't know where to go.

What to put on the blog
Determine your audience

Are you writing for experienced beekeepers who want purely the newest scientific findings or are you writing to customers who know nothing about keeping bees? Whenever you write a blog post keep your reader firmly in mind.

Don't overwrite

This is not a school paper! It is a personal account of what is going on in your apiary, at your farm or at your club. Write as you might talk to a customer, or how you would write a letter to a good friend. Dry writing is great for scientific papers but very bad for a regular customer who will tune out if things seem cold and disconnected. If you are writing for a scientific community your writing will be a bit more formal but try to still keep it personable.

Another way to overwrite is to simply write too much. Don't let the idea that you must write a novel keep you from writing a blog post. There is no reason your post couldn't be a few sentences, mostly pictures or even a short video. Research has shown that most people read the first paragraph of anything and then their interest slowly tapers off and they click to the next site. Keeping most blog posts to about 500 words will make things easier for you to write and keep readers from straying before they reach the end of the post. That said if your post is shorter or longer there's no need to rewrite it. If it needs to be longer then write longer!

Advertising and Your Blog
"Selling" Your Blog and Gaining Followers

Traditional advertising tells us that we NEED to get a LOT of followers for our blog or it's a waste of time. But with arenas like Facebook and Twitter, fewer people are

signing up to subscribe to blogs via email. Indeed most of your readers will come from other places, either from emails you send pointing to your blog or links you've posted on other social media sites.

Don't get caught up in the numbers, especially not when you're first starting. There's time to grow a traditional following later, when you've honed your blog writing skills and better determined your audience. Count your page views (the people who got to your blog page) if anything, not the actual subscribers.

Selling Ad Space

While selling ad space seems like a great idea it comes with its own set of considerations.

Do you really endorse this product and the people who sell it? Their bad customer service or product problems will reflect back on you if your customers found their site through your blog.

Unless your blog is very popular the amount of money you make will likely be VERY small.

How do you decide what ads you take on and how much time do you want to spend finding potential advertisers?

This doesn't mean you shouldn't have advertising but if you do you'll want to establish your policy before you start taking ads. One option is to take everything you can and simply make a disclaimer that you do not necessarily endorse these products. This is a fine tactic but your page will eventually look very cluttered if you have ads all over your page, distracting from your actual writing. Another option is to take only products you endorse but this means insuring it meets your standards when you first take the ad, and then checking that nothing has changed in the product quality, customer service, etc. on a periodic basis. Lots of work for what likely will amount in precious little return.

Using Your Blog to Sell Product

If you're a business you'll certainly want to use your blog to sell your product. But as with everything, only using your blog to sell your product makes your blog seem like television advertising; an annoying inconvenience for most. Let people know where you are and certainly let them know about any sales you have but make sure this isn't more than ¼ of the content you're posting. Do remember to put end dates on any sales posts or you'll have customers years later asking for that same sale price!

What makes a blog successful?

There are a few simple things you can do to increase your engagement on your blog and in other social media.

- Ask your community for feedback. A simple "Did you try our new fireweed honey? What did you think?" can help get the community involved and replying to your posts. You can also learn about your customers and their desires this way so you can better cater your business to their needs.
- Links. Have you written something in the past about a topic you're mentioning again in your new blog post? Put a link to that article in your blog. If there's a good outside source for information or if you're pulling some scientific information from another site make sure to link to that as well. Again, these things help search engines like Google find your blog but it's also good web form to point to information sources outside your own blog.
- PICTURES! People love pictures. In reality blog posts with pictures only will likely get you the most readers. But even when you are writing make sure to include a picture with the post. Just like a magazine cover this is a visual stimulus that helps readers engage with your writing. Photo editing tools like Instagram, Hipstamatic of other smart phone apps can turn a perfectly dull picture into something that looks artistic.
- Use headings and bullets to break up content. This is especially true when writing an educational post. People like steps they can easily follow.

While there's a lot you can learn about writing the best blog posts the most important thing to do is to write! Don't let rules or ideas stop you from writing what you'd like. Eventually customers are connecting with you as a person, and that includes your personal writing style. BC

Jessica Dally is a professional in the social media business, running the social presence for Wildlife Media (Chris Morgan Wildlife and BEARTREK), World of Beekeeping, Seattle Free School and recently assisting with the Puget Sound Beekeepers. She has worked with TechSoup, an international nonprofit, assisting and teaching other nonprofits on the use of social media.

Blueberries As Bee Plants

Connie **Krochmal**

Low blueberry.

Whether they're eaten fresh, frozen, canned, or dried, the versatile blueberries are a delightful treat. The plants provide bees with pollen and nectar.

Blueberries are the second most popular fruit in the U.S. About 50 species occur worldwide with around 15 to 20 being native to North America. Most of the world's blueberries are grown in the U.S. The major blueberry production occurs in Oregon, Washington, North Carolina, Michigan, Indiana, and New Jersey.

General Plant Description

Under good conditions, these tend to be long lived plants – over a century. Depending on the species, they can be deciduous, semi-evergreen, or evergreen. The height ranges from several inches to around 20 feet. The small alternate leaves, often toothed, are mostly egg-shaped to elliptic.

Either pink or white, the bell or urn-shaped blossoms open in clusters. The fruits, which can be blue, pink, or white, vary from one-eighth inch to an inch across. The skin has a waxy bloom.

Native Blueberries As Bee Plants

The native blueberries are important honey plants in some areas, particularly the Northeast. Generally blueberry honey has a tangy flavor. It will be darker than cranberry honey.

Native blueberries yield a mild, very sweet tasting, light amber honey. Hard to extract, it is high quality with a good body. Four native species are recognized as excellent honey plants, including the following. The early sweet or dwarf blueberry (*Vaccinium vacillans*) is found from Missouri to New England southward to Georgia. It yields lots of excellent flavored amber honey.

The velvet-leaf or sour top blueberry (*Vaccinium myrtilloides*) is a lowbush species. This grows from New England into Virginia westward to Montana. Oval leaved blueberry (*Vaccinium ovalifolium*) often yields surplus honey. This species is found from Alaska and Oregon to Indiana and Michigan.

Highbush blueberry (*Vaccinium corymbosum*) grows in the North as far westward as Wisconsin. This can provide a surplus of a hundred pounds of honey per colony.

Growing Conditions

Blueberries tolerate a variety of climates from cool and dry to warm and humid. Temperatures below -29°F typically damage some canes.

The highbush type is mostly grown in the East and Pacific Northwest. These need 650-850 chill hours.

The lowbush blueberries are suited to the North and the Appalachian Mountains. These are typically managed wild plantings.

The rabbiteye blueberry thrives in the East, particularly the South. Its chill requirement is only 250 to 500 hours.

Any soil where rhododendrons and azaleas thrive is suitable for blueberries. Sandy soils high in organic matter or loamy types with sand and peat are especially suitable. This needs to be moist yet well drained. The preferred pH is generally 3.8 to 5.4.

Late Spring frosts can harm partially open blueberry blossoms and fruits. Windy and exposed sites are unsuitable. Full sun is generally best. Keep them away from nearby shrubs and trees, particularly black walnuts. Most blueberries require a growing season of about 160 days. The lowbush is adapted to a shorter season.

Planting Blueberries

The spacing varies by location and plant variety. General guidelines are four to six feet between plants with eight to 12 feet between rows. The wider spacing is needed if farm machinery is used for weed control or harvesting.

Plant as soon as the ground can be worked in the Spring. In some areas this is also done in the Fall.

Named varieties of blueberries don't come true from seed. These are propagated from cuttings. For most beekeepers, the simplest approach is to purchase plants.

Varieties and Types of Cultivated Blueberries

The most widely cultivated species are rabbiteye (*Vaccinium ashei*), the highbush hybrids (*Vaccinium corymbosum*), and the half-highs, which are highbush/lowbush crosses. Producing very large fruits, the half-highs are hardy to zone three. The best known variety is Northland.

Spreading by runners, the lowbush (*Vaccinium angustifolium* and *Vaccinium lamarckii*) plants are around a foot tall. The berries, which are typically frozen, are harvested with special rakes from managed wild plants. Ripening earlier than the highbush, these are hardy to zone three. A number of cultivars are available.

The highbush are tall plants with fruits that are more flavorful than those of the rabbiteye. Thriving in zones four through seven, these have a high chill requirement. They need more pruning than the rabbiteye.

Adapted to heat and drought, rabbiteyes are vigorous, very productive plants. These are recommended for zones seven through ten. The small berries ripen over a long period. Native to the Southeast, they're less picky about soil and pH than other blueberries. The tall bushes range from eight to 20 feet in height. They can yield larger crops than the highbush.

Caring for Blueberries

Weed control is essential for these shallow rooted plants as they're unable to tolerate competition. When cultivating the soil to remove weeds, avoid damaging blueberry roots. Due to the fine shallow roots, blueberries need an inch of water per week.

Blueberry plants are often mulched to control weeds and keep the roots moist. Sawdust, bark mulches, and shredded oak leaves are suitable. Avoid using cedar mulch. Spread a two to three inch layer of mulch. For best results, use aged mulching materials.

Annual prunings should begin the third year after planting blueberries. This keeps the plants vigorous. The best crops come from the most vigorous wood of the previous year's growth. Cut out weak and older canes to encourage new growth. Do this any time from Autumn after the leaves Fall until Spring before the foliage emerges. As an alternative to pruning, managed wild blueberry fields are often burned or mowed every other year. This maintains a good yield and encourages new shoot growth.

Begin fertilizing the year after the blueberries are planted. This is needed in order to maintain plant vigor and optimal fruit yields. Run a soil test to determine specific fertilizer recommendations as this can vary according to soil conditions and species. Excessive fertilizer applications are the leading cause of blueberry plant death, particularly too much nitrogen. Apply fertilizer in the Spring, and water it in.

An acid fertilizer works very well, such as ones labeled for azaleas and rhododendrons. Cottonseed meal and blood meal are good sources of nitrogen. A slow release formula can also be used.

Problems of Blueberries

The insects and diseases can vary by region. Problems typically start to show up the second year. Potential pests

include blueberry maggots, bud mite, fruit worms, plum curculio, leaf miner, and leaf hopper. Protect the fruit from birds by using netting. Deer browse on the plants.

Blueberries sometimes suffer from mummy berry, botrytis blight, powdery mildew, and anthracnose. Stem canker can be avoided by planting canker-resistant varieties. The rabbiteye varieties have some resistance to diseases and leaf rollers.

History of the Blueberry

This was one of the first native foods used by the early European settlers. Colonists in New England called them hurtleberries, a name used in England and Europe until about 1670 when they became known as huckleberries, which is actually a related species. The name blueberry comes from a Scandinavian word, blaeberry, a term used in England as well. In Scotland they were called blueberries.

For Native Americans, wild blueberries were an important food source. They dried and ground them for use in soups, stews, and meat dishes.

With so many wild blueberries available few Americans attempted to grow them before the early 1900s. The commercial highbush blueberry industry is largely due to the pioneering efforts of Dr. F.V. Coville of USDA. Elizabeth C. White of Whitesbog, New Jersey worked with him by selecting desirable plants from the wild. Other research took place in New Jersey, Michigan, Maine, North Carolina, and Florida. Rabbiteye varieties were later released by USDA and various Southern agricultural experiment stations.

Harvest and Yield

Remove the flowers during the first year to help the plants become established. Blueberries reach full production in five to seven years.

The yield varies by plant type and variety. Beekeepers can expect an average of six to eight pints per plant. Generally the lowbush plants yield less than the highbush. Managed wild plantings are less fruitful than cultivated ones.

The berries ripen about a week after they change color. These won't finish ripening if they're harvested prematurely. Lowbush blueberries can be harvested with hand rakes. The highbush are picked by hand or mechanically.

For most varieties, the harvest extends over several weeks. In Florida, it begins in late April. For Michigan and the Pacific Northwest, this typically starts in mid-July. The highbush berries ripen two to three months after the flowers open.

Pollination

Although cross-pollination usually isn't absolutely essential, this typically results in a better fruit set, larger fruits that ripen earlier, and at least a 50% greater yield. The pollen source should be planted within a hundred feet of the ones needing cross-pollination. One to five hives per acre are ideal.

Blueberry Varieties for Beekeepers

A number of varieties stand out from the crowd, including the following.

Bluecrop highbush

Considered one of the best varieties in every way, this is the standard by which others are judged. One of the top seven varieties in America, this does well in zones four through seven. The reliable plants bear 25 pounds per bush.

The upright, vigorous plants are four to six feet in height and four feet across. Susceptible to stem canker, Bluecrop offers some disease resistance-especially mummy berry. This is unbothered by late Spring frosts.

Bluecrop adapts to a range of growing conditions. Tending to overbear, it benefits from careful pruning. This mid-season variety ripens after Blueray. These berries don't crack or drop.

Blueray highbush

One of the top varieties, this long-time favorite thrives in zones three through seven. It tolerates cold Winters and hot Summers. Widely grown in the Northeast and Midwest, it has few disease problems other than stem canker.

Four to seven foot tall, the upright, vigorous plants need careful pruning to prevent overbearing. Blueray can yield 25 pounds annually. This mid-season variety ripens over a month. The best flavored of the highbush varieties, these premium quality fruits don't crack.

Legacy northern highbush

This is considered the best tasting blueberry of all. A highbush/rabbiteye cross, it is recommended for zones five through nine. This is well suited to most regions. With a low chill requirement, the four to six foot tall plants are vigorous and upright. This mid-season variety ripens over six weeks.

Northland half-high

This lowbush/highbush hybrid needs cross-pollination. Easy to grow, Northland adapts to various soil types. The limber branches withstand heavy snow loads. Suited to zones three through seven, this is ideal for areas with short growing seasons.

It bears large crops every year. Prune regularly to maintain good yields. The upright, vigorous plants are typically four feet in height. The berries ripen over a month from early to mid-season. This can yield 20 pounds per bush.

O'Neal southern highbush

Among the best of the southern highbush varieties, this does well in zones five through ten. Cross pollination is helpful. This adapts to adverse growing conditions, and responds better to light soils than most varieties.

The erect, upright plants are four to six feet tall. One of the earliest varieties to ripen, these blueberries are the best flavored of the southern highbush varieties. They yield up to 15 pounds per plant.

Sharpblue southern highbush

Considered one of the best tasting blueberries, this is a leading variety worldwide. Suited to zones seven through 10, it only needs 200 chill hours. This highly adaptable variety is almost evergreen.

The upright, vigorous, fast growing plants reach five to seven feet in height. It can yield fruits almost year-round in mild climates. The plants bear 18 pounds of fruit, which ripens early.

Tifblue rabbiteye

Considered the classic blueberry, this highly popular variety is the hardiest of the rabbiteyes. It grows well in zones six through nine. It is a reliable and adaptable plant.

The vigorous, upright bushes reach eight to 14 feet in the South. A late bloomer, it is untouched by late spring frosts. This mid to late season variety bears a large crop annually. BC

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

When Good Bees Turn Bad

Colony Robbing

Ross Conrad

Honey bee workers normally forage for nectar and pollen from flowers which are brought back to the hive and converted into honey and bee bread. Unfortunately, foragers can also seek to obtain a quick payload by seeking out anything sweet they can find, even to the point of ransacking another colony. Such foraging activity known as robbing, can spread disease, cause colonies to become abnormally aggressive and defensive, make queen introduction more difficult, and working with colonies unpleasant. In extreme cases robbing can cause a colony to starve to death due to the loss of all honey stored within the hive.

What causes the fall from grace?

For one reason or another, foraging bees tend not to be very interested in robbing or even going after exposed honey when natural nectar sources are plentiful. Thus, a dearth of nectar is a primary trigger that leads to robbing behavior. Especially vulnerable are weak hives whose populations are low, such as newly hived packages and nucleus colonies, queenless hives, or hives suffering from a mite overload and/or disease. Such colonies may not have enough guard bees to protect the entrance(s) to the hive adequately. If the hive entrance is too large an opening, or if there are too many entrances, even a strong hive may have trouble protecting itself and keeping robbers at bay.

Feeding colonies from open containers can also cause robbing among hives. Worker bees dancing to recruit additional foragers to a food source close to the hive will communicate using a circular dance. During the dance, the worker will occasionally stop and offer a taste of the food that has been gathered to prospective foragers that are following the dance within the hive. When the food source tastes and smells like honey, or has little to no scent as in the case of sugar syrup, then any other hive located within about a hundred yards of the colony will become a target for the foragers. Even when a feeding stimulant is added to the sugar syrup in a bulk feeder to endow the feed with a unique scent, other colonies will become the target of robbers as the foragers from those colonies bring in the scented feed and make their hives smell like the food source. The same is true for any feed or honey that is spilled or left exposed in or around the beeyard.

The boardman entrance feeder that fits in the bottom opening of a standard Langstroth hive and is often sold as part of a beginner's kit, is notorious for precipitating robbing behavior from neighboring colonies. This feeder, located so close to the hive entrance, is difficult for a colony to protect from robbers especially when the day-time temperature cools down and many bees are needed to maintain the warmth of the brood nest.

Tips for recognizing and catching robbers red-handed

One sign that robbing may be occurring in your hives is the presence of dead bees laying about in front of the hive or on the inner cover when the outer cover is removed. These carcasses are the remains of robbers that were caught stealing from the hive and guard bees that died defending their nest. Another telltale sign of robbing are the remains of cappings torn from the combs as the robbing bees worked to get the loot and get out of there as quickly as possible. As a result, the cells of the empty combs from hives that have had their honey stores robbed out will be ragged looking since the robbers don't take the time to remove the cappings neatly.

Colonies that have been the target of robbing will be more defensive than normal. Guard bees will be aggressive and will tend to closely inspect all foragers upon their return. Robber bees that are challenged in this way will be quick to take to the wing, flying around the hive waiting for another chance to try and enter. This should not however be confused with bees that are hovering around the front of the hive as they leave the colony to take their first flights. This is where your ability to notice the fine details of honey bee body language and behavior comes in handy. Bees on their maiden flights will be facing the hive entrance, smoothly and purposely flying back and forth as they orient themselves to their colony's appearance and location. Robber bees by contrast will tend to act more like they don't belong there, flying in irregular patterns around the hive, darting to-and-fro looking for a chance to slip past the guards. Foraging workers with the intent of robbing can be seen inspecting cracks in the hive and places on the hive that are in stark contrast to the color of the hive, such as knots in the hive's wooden exterior, as they

Robbing Tupperware.

Strong hive.

seek out a way inside that is not well guarded.

To the beginner's eye, a hive being robbed out can seem normal due to the abundance of bee activity around the entrance. It is upon opening such a hive that the signs of robbing activity become more obvious. Rather than stay in the hive and on the combs, robber bees will act nervously, abandoning the combs and taking to the air as soon as the hive is opened. Upon opening up a queen-right hive full of bees that belong there, a high percentage of the bees that immediately take to the air they will typically do so because they are intent on attacking you. Of course if the colony is smoked appropriately, few if any will actually do so. When a hive that is being heavily inundated with robbers is opened up, lots of bees will take to the air, even when smoke has been used, but few of these bees will actually come after you. These robber bees are much more interested in returning to the combs in the hive as soon as you are done disturbing them so they can finish the job they started.

Prevention . . . the best rehabilitation

As with many hive challenges, keeping healthy, strong colonies with large populations is the best defense. This means dealing with mites and diseases *before* they become an issue. It is also helpful to match the size of the cavity of the hive with the colony's population. With bees concentrated on fewer combs, rather than spread thin among many combs, the hive will be easier for the colony to defend.

Reducing entrances down to a single small (approximately one-inch) opening can compensate for a hive that lacks enough guard bees to do the job. Equipment that is new or has been well maintained really helps here. Rotten, broken, or cracked supers whose wood is split or warped will need to be repaired or at least caulked or filled with spackling compound, beeswax, or mud.

It also helps to leave your apiary neat and tidy without broken combs, hive scrapings, bee feed, or honey drippings scattered about. Feeders that can be placed inside the hive (such as division board or frame feeders that replace one or more frames within the brood nest, hive top feeders, and feeding pails enclosed within an empty hive body) are preferable to feeding from open containers or entrance feeders. Freshly extracted honey supers, or frames containing bits of honey that you want the bees to clean up by robbing them out should be placed at least 100 yards away from your apiary.

It is far better to work to prevent robbing behavior rather than try to stop it once it has begun. Once it has started, robbing behavior can be very difficult to stop the same day. As a general rule, it is best not to work hives when robbing is prevalent. This is why harvesting honey is much easier and more enjoyable a task when done a little early in the season, before the last of the blossoming plants have lost their flowers and gone dormant in preparation for the winter season. Unfortunately, despite our best efforts there are going to be those times when working with the bees just can't wait. When harvesting honey, inspecting, or ma-

nipulating hives when robbers are active and could become a problem, work quickly and try not to leave hive open too long, and keep all hive bodies and supers covered as much as possible. Inner covers, outer covers, or a damp cloth can all be used to keep exposed hives and equipment covered up thereby reducing robbing exposure. It is during times like this that one must be extra careful to replace all covers securely and not accidentally leave supers or hive bodies askew creating additional openings for robbers. BC

Ross Conrad is the author of the revised and expanded edition of Natural Beekeeping: Organic Approaches to Modern Apiculture, *due to be released April, 2013. Ross will also be teaching an advanced beekeeping class on Saturday April, 6, 2013 in Lincoln, Vermont. For more information or to register, contact him at* **dancingbeegardens@hotmail.com**

Check Out All The New Products This Month On Page 13

DOWNTOWN

City Bees Need City Buzz

Sometimes, the exhortation to "get out there and do outreach" is about as appealing as one of those doctor's appointments that concentrates on increasing fiber and decreasing waistlines. Many times, when I get up early to chase a queen and load an observation hive and all the other boxes, tools, and props used for a Summer camp or an elementary school presentation, it seems crazy to spend yet another half day on such a foggy agenda, and to put my bees through an event which will cost the hive some individuals and undercut important colony activities. It's a gesture of hope, kind of like clicking my heels and hoping to end up in Kansas. Experience tells me, however, it can be better than a free ticket to Oz.

Beekeeping in the city has changed my life, and little by little it has a chance to change the lives of children (and their parents), helping to build a better future both for them and for the honey bees. And it always seems to load me up with hope and energy and a little pride. Without acceptance for the bees and encouragement for beekeeper, it is hard to ensure a place for urban beekeeping after the first wave of novelty passes. Educational outreach is a wonderful way to make that happen.

Urban beekeepers know that *at least* a bit of our motivation is just how interesting and counterintuitive it seems. We pursue an agrarian activity in "the concrete jungle," and peacefully bring tens of thousands of insects that many view with fear into a place that is thick with humanity. Our neighbors could fairly ask, "What were you thinking?!" Perhaps we should tell them, eh?

Goal one is creation of a community whose first reaction to the introduction of a new beehive is "How incredibly cool!" rather than "Are you out of your mind?" As fun as it is to be an outlier, we really do need to defeat the image of eccentricity and strangeness. We can do this by demonstrating the way our bees fit in, the way they make the many vibrant green spaces downtown flourish, and they way they replace fear of the natural world with participation and connection. And if we start with the kids, before they adopt the fears and disconnection to the environment that happen to so many adults, we can bring the whole human clan back into the light. Or it can feel that way after a fun day out with the obs hive and the kids!

Judging from what other beekeepers often say, walking into a room full of kids is one of the most terrifying things an adult can do. Don't worry, we can help. Whether that classroom is uptown or downtown, in the city or in the suburbs, the kids' eyes will greet you with the same two questions: "Do you *really* care?" and "Are you interested in connecting me up with that?" And your answer is certainly "Yes!"

I work with two dramatically different youth populations, for the most part, though they all end up being curious kids at heart. Kids are not stupid, and they are not patient, but they are interested and energetic and lovely, sincere advocates for things they believe are right and true. Honey bees can use friends like that.

My downtown kids usually put me through an "Are you serious?" drill, where they basically need me to prove two things: that I know what I am talking about, and (more importantly) that this is coming from a place of real caring and passion. They are used to people from posh neighborhoods bearing prescriptions about what they should be doing with their lives, and seem deeply interested in whether I am going to share something meaningful to me as a human or to lecture on like a public service announcement.

The first time I worked with the Washington Youth Garden, the observation hive leaked bees, which caused a fair amount of silliness and chaos. But all that stopped when I (at a loss) just started picking up escapee bees, and holding them. Children who wanted to stomp bugs very quickly turned into curious little people who wanted to hold them, and learn about their lives. Together we looked at them really close and saw just how fuzzy and delicate and gentle they are, even with the stinger. I think my downtown kids know more about danger than most of the others, and understand that risk is real, but sometimes really worth it. And something that is small and precious and in a fight to survive is something to which they can relate.

The suburban kids are also skeptical in their own way. They usually have some previous exposure to the

subject matter, and want to know whether I am wasting their time, in this case with stuff they already know. It can actually be a little difficult to regain control of a presentation when a well-informed elementary school student attempts to demonstrate how much they know during my 45-minutes-including-Q&A slot! But using an obs hive to demonstrate life going on in 3-D before their very eyes – and real examples of just what a trip pollination is – are aces in the hole.

One time in Fairfax County, I called on a smallish second grader who was almost out of his chair with an energetically-raised hand. I asked, "Do you have a question, little boy?" To which he answered, in a tone appropriate to any court of law, "Not so much a question as a comment."

Many of these kids have learned that being clever and informed is very important, and their parents and teachers have worked hard to make sure that they are both. We should, too. I would argue that these kids have just as much a deficit of connection to the wonder of the bees as kids who never get to a science museum. I am more likely to deal with kids who are actually afraid of nature in the 'burbs: it is an oversimplification, but folks who have worked so hard to get their kids to the safest and the "best" have often transmitted a sense of general worry about things that fly, buzz, or grow outside a planter. Children accompanying me to an apiary have left the group in order to step on every insect they see around them, saying "It's what my mom does."

But the bees make pretty short work of that. Bring a populated observation hive into a group of kids and you will soon have preteens glued around the box – and they are usually better at spotting queens and drones than we are (and I make sure that they know it). Hold up a pumpkin or a watermelon or a strawberry and get the kids to think about how every single seed in or on them was once a grain of pollen carried by a bee, and how flowers simply would not have future generations unless they could rely on species to which they are not even remotely related.

You have to watch your wording on this one, but I often ask kids how human parents would feel if they had to check in with a local praying mantis or grasshopper if they wanted to add another son or daughter (and bugs are more closely related to us than plants are to bees!)

In our region, Summer is the only time I can really do live-bee outreach: by the time schools get rolling in the Autumn, my girls are beginning their Winter shutdown and are both vulnerable and less cooperative. In the Spring, the insects-that-pollinate unit in the curriculum may take place before the weather is safely warm enough to move queens and brood.

But there are Autumn and Winter opportunities to present bees to the public, and I recommend that beekeepers consider putting together, individually or sharing in common, a "teaching super" (an idea from another beekeeper) that can be brought into almost any location. My teaching super is a deep box that contains both deep and medium frames, including bare foundation of a couple of kinds, the arc of the brood nest (often with left over pollen or capped brood), queen cells, drone cells, extracted honey frames, dark and light comb, and a foundationless frame on which the bees have begun to draw. This stuff is often accumulated during culls throughout the season, though it helps to have this project in mind as you work in general.

Bring veils and tools and a smoker, though leave the lighter at home. I like to bring a skep, too, and ask the kids what I would have to do to get the honey from the bees in a structure like that. They usually express indignation and a new appreciation for movable frame beekeeping. Not bad for first graders, eh?

Outside of a school setting, and when the audience has a lot of adults, I consider adding in a honey tasting, making sure that local honey gets contrasted with both clover and whatever varietal is completely different. Many folks think they can't tell the difference between one honey and another: you can expand their experience!

There is almost limitless demand for this material. When first getting started, I used to take requests for presentations that came into my local club. Once I got some presentation chops, I started calling places that were near and important to me to offer presentations. After understanding of CCD went viral, folks started calling on their own. People began to understand that bees were important and they needed advocates, but they needed to know how to help. We can do even better than that, however. We can share the joy as well as the worries!

City beekeepers, you can really give the people what they want, and make endless friends for bees with just a couple of sessions every year. Bees are important to community gardens, to High Holidays religious celebrations, to environmental advocacy groups, to food access activists, to garden clubs, to elementary schools, and on and on. If you have not been asked, please consider reaching out to an institution in your neighborhood if they would like an hour of your time, sharing something you love. Together, you will build a community which is better for both people and bees. BC

Toni Burnham keeps bees, goes to schools, Summer camps and makes friends all over her city.

Foundation Support Pins And Rods

Tom **Peck**

I have been a beekeeper for 28 years and have spent many frustrating hours installing and removing bent and rusty support pins, tangled wires, grommets and crimping wire in the frames to support the foundation. Many women are now keeping bees and have complained that wiring is too difficult and time consuming. I finally realized there must be a better way in which it is less time consuming and easier to install. After much thought, two new items have been developed for beekeepers. One is the Support Pins and the other Support Rods.

SUPPORT PINS

The support pins are designed to replace the metal split rivet which is inserted in the end bar of the frames. The plastic support pin is more flexible and is easily inserted into any standard frame. A mold was designed using the plastic injection method. The special steel required and design costs were the major expense. We changed the pin shape three times at the suggestion of beekeepers and consulting with two major bee supply houses to get the best support pins.

The support pins have a round head with one side beveled which lines up with the two prongs that fit around the wax foundation. This makes it easier to install. The foundation is installed in the frame and two pins in each end bar are sufficient for hive body or medium frames. The pins will not rust and can be used again. They are color coded to match the queen color for each year. The color for 2013 is red.

SUPPORT RODS

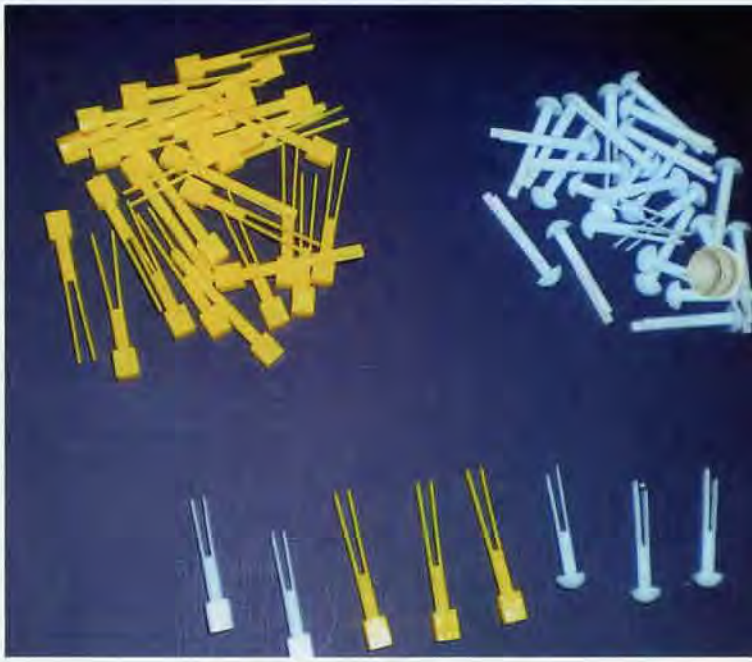
I have also designed Support Rods designed for easy installation of all sizes frames. These are to replace the old method of pins and wiring of the frames. The rods are slightly thinner in diameter than the drilled holes in the end bars and fit all frames from major frame producers that are a standard size. The rods have been issued a "Patent Pending" status in the United States Patent Office.

Support rods are one inch longer than the distance between the end bars. The rods are inserted through the two end bars. A locking clip is inserted over the rod end and pulled tight. The rod can be drawn tight with pliers and will not slip. The concave side of the locking clip should face the frame and can be installed with your fingers and pulled tight with pliers. After installing the rods, the foundation can be installed. The foundation should rest against rod but does not need to be embedded into the foundation as the bees will build comb around the rod and you won't be able to see the rod. The rods also are color-coded the same as the queen color; color for 2013 is red.

Some beekeepers are not using a full sheet of foundation and only a starter strip. They then insert two rods and the bees will extend the comb downward and enclose the rod. Beekeepers report that it is easier and quicker than trying to install wiring. I have had feedback from all across the country and those who have tried them are very satisfied with the results. All have saved time and effort, and color-coding enables them to know the year the foundation was installed.

The rods and pins are MADE IN AMERICA which provides jobs for American workers. The rods and pins are sold by two major bee supply companies or they can be ordered directly from me. We are offering 50 rods and 50 support pins which include postage for $30.00. Why not try them; I know you will like working with them as they are easy to install and will save you much time if you are still using wire. BC

You can contact me for additional information at 717.545.6982 or email Tpeckbees@comcast.net.



Do I Want This Book?

Ann **Harman**

I have no idea.

Watching and listening to many people selecting books for themselves is absolutely fascinating. How do *you* decide whether to buy a book or not? No, not the best-selling novel. That particular book is bought, read, at least part of the way; then a decision is made whether to finish reading, keep it, or stop and send it to your most bothersome relative.

But what about selecting a book that is designed to give you information, a reference book, an instructive book. A book that will help you make decisions, take action. For the most part books on bees and beekeeping fall into these categories.

The cover of a book, like the label on a honey jar, attracts attention. Unfortunately covers on many beekeeping books, especially older ones, are mundane, stretching to boring. Yellow seems to be the predominant color. Honey, of course! So it seems that the title is what really leads prospective purchasers to pick up a book. Now the real quandary begins. A peek inside the mind of the buyer reveals the question "Do I want this book?" Then follows a random flipping of pages, an occasional pause at a picture, then a quick look at the front and back cover. Unfortunately all this reveals little of real importance. But it seems to be a necessary ritual.

Perhaps the most controversial title is *Beekeeping for Dummies*, one of the many *Dummies* books on dozens of different subjects. Those beekeepers that are familiar with the *Dummies* books are quite excited to find the one on beekeeping. They want the book. Some beekeepers refuse to buy it with the reason being that the title is demeaning. No amount of explanation that it is a fine book, especially for beginners, changes their opinion.

Books designed for instruction or reference have a table of contents at the beginning of the book. This table can list just the chapter headings or be more informative with subheadings or topics. Here we are getting an introduction to what topics the book covers. An instructive book should have an index, found at the end of the book. Here is the fine detail of what is inside the covers. However, how many prospective purchasers pay attention to the table of contents? Or even the index?

Here is someone looking for a book that gives information on making equipment. When making equipment is not mentioned, either in table of contents or index, then wouldn't the sensible conclusion be "This book is not what I want." But the prospective buyer chugs on. "Does this book tell you how to make equipment?" "No."

Perhaps our love of the comic strips guides us in our choices of books. Or perhaps the memories of wonderful childhood books. People will buy books with lots of pictures even if the pictures have little to do with the information presented in the book. Color pictures are preferred over black and white. Photos are preferred over drawings. Even bad photos over instructive drawings. Books without enough pictures are probably thought to be boring – too many words. But this book is designed to give you information. Evidently in the mind of the book-shopper there is a balance between information and decoration, with decoration being the more important.

Beekeeper meetings, especially ones with workshops, bring a sudden interest in a particular topic, for example, making mead. To some in the audience the presentation or workshop made the project sound so interesting and easy that one or more books had to be purchased immediately on that topic. Whether that beekeeper tried, failed, succeeded or forgot about it will never be known. But the book is now part of that beekeeper's library.

The mere mention of some ancient beekeeping craft at a beekeepers' meeting prompts some to inquire for a book on that one particular topic. Have any books really been written giving instructions on tanging? Probably not, but someone is sure to be out there looking for one.

Springtime brings a search for books about plants. However beekeepers want to be specific about what sort of plant book. The number of requests for "honey plants of my county" exceeds the number of requests for "honey plants of my area." A request for "honey plants of my state" comes in third. Are some useful honey plants really confined to the small area of a county?

Some beekeepers are book collectors. I often wonder if they have read all of the books in their collection. These collectors are easy to recognize. Their first question is "what's new?" meaning "I don't have it." Generally it makes no difference whether the book is written for first-year beginners, is on a single topic of beekeeping, highly technical, or very badly written and presented. That new book will have a place on the collector's shelf. You must admire the collector. When a question on beekeeping arises in the mind late on a Saturday night, the answer is certain to be in one of the books.

Unfortunately a large collection of books can lead to some different questions, the main one being "did I buy this book already?" Quite a number of beekeepers lose track of

the books they have. Sometimes repeat purchases happen. Other times a desired book is not purchased in the belief that that particular book is already on the home bookshelf. Occasionally a beekeeper has made a list of books already owned and sometimes has even listed books wanted. Here is the thoughtful and economical purchaser.

Is every new book a worthwhile purchase if you are not a collector? Here we are back to ways to discover what a new book has to offer. Book buyers are not always certain what they are looking for. New books are reviewed often in this magazine.

Reading those reviews is really important in selecting new books. True, after purchase of the new book you may disagree with the reviewer. If you really like and appreciate a book given a bad review, now you have an appreciated book for your collection.

Perhaps the saddest words are "I lent my book ____ (you fill in the blank) some time ago and I don't remember who has it." Well, that book went out-of-print a year ago and its replacement may have to be searched on the used-book market. There it may be much more expensive than the original cost. Lesson learned? Sometimes.

Is every book on bees and beekeeping brand new? What about reprints of classic books? What about reprints authored by some of the "greats" of beekeeping? Reprints of books by Quinby (1853), Langstroth (1878 reprint of original 1853 book), C. C. Miller, Doolittle, Brother Adam (Buckfast bees), Lovell's 1926 *Honey Plants of North America* (Root publication) and more, are available. These are excellent additions to any beekeeper's library, provided that the reader both appreciates older writing styles and understands that not all information will be current. It may be best for a first-year beginning beekeeper to read and study one of the excellent current beginning beekeeper books to obtain a modern approach. Then, if interested, the beginning beekeeper can start assembling a library to include some of the classics.

Fortunately the reprints are much less expensive than original editions of the same book, Unfortunately some important and useful books have not been reprinted and thus prices of the originals on the second-hand market can be quite incredibly high. Perhaps some will be reprinted in the future.

Shopping for a beekeeping book can be frustrating. Where do beekeepers go to find their beekeeping books? Some actually look in a bookstore. The number of large chain bookstores has diminished greatly but some large local stores do exist. Their selection is generally very minimal. But at least the beekeeper can have a look at a book.

Those beekeepers who have a collection of catalogs of equipment suppliers will find a large and varied selection of books. A visit to Amazon on the Internet also actually yields a good selection. However, books can only be ordered, sight unseen. Amazon does let the purchaser return a book if unsuitable. Equipment suppliers may or may not offer a return. State, regional and national beekeeper meetings are where beekeepers have the best chance to have an actual look at books displayed at the various vendors' booths.

Electronic readers, such as Kindle®, are becoming increasingly popular. But beekeepers using electronic readers complain that few bee books are available. Well, the majority of books on electronic readers are ones that are for the majority of people. The beekeeping world is very small in numbers. It will take quite a while for the selection of bee books to increase and even then many books will not be found on the readers.

Some local beekeeping associations maintain a small library of books for their members. The club library provides an excellent opportunity to see and read books. Donations of books to these libraries are appreciated. Although books can be expensive, clubs should be encouraged to purchase new books and also new editions of the popular ones.

Many local associations offer courses not only for beginning beekeepers but also for experienced ones. Queen rearing courses are also given. Books are usually chosen by the course teachers for the beginning students. Two considerations affect the choice of book: content and price. The information must be suitable for someone who knows little or nothing about bees and beekeeping. The price must fit in the fee the association is charging for the course. Some courses are only for a few days, others are for six to eight weeks and priced accordingly. The book chosen also has to be one that the instructors feel comfortable using.

Are book lists supplied to beginning beekeepers in those courses? Sometimes. It certainly would be a good idea for a beginner to have a list – not so big as to appear overwhelming – but a useful list. The real value of a book list is if it is annotated. A few sentences can indicate to the beginner what the listed book has to offer.

It is interesting to note that the best sales persons for beekeeping books are the beekeepers themselves. Countless times I have seen an experienced beekeeper lead a novice to a vendor's table covered with books and proceed to thump on a book and proclaim "that is the book you need to buy!" The indicated book is purchased.

Now we need to look beyond our borders. Why? Well, honey bees are really the same in Great Britain. The queen lays eggs; the colony swarms; and bees make honey. At trip on the Internet to the Bee Craft shop, the International Bee Research Association (IBRA) and Northern Bee Books will open up to U.S. beekeepers a new world of excellent books and booklets. A few selections are available on Amazon but all can be ordered directly from the UK. Are all these books just a repeat of what is available in the U.S? Definitely not! Please take some time on a rainy afternoon to see what is offered. And keep in mind that an excellent book written in the UK on bee anatomy describes the bees in your hive too.

Now I'll return to reading the new bee book I just bought. No, I will not lend it to you. It's now part of my collection. BC

Ann Harman travels all over the world, keeps bees in Virginia and gives us all guidance.

The Cappings Scratcher

Jim **Thompson**

Thinking about harvesting the honey crop, I will concentrate this article on the capping scratcher which used to be a nice tool to have but now may be considered a necessity. There are other uncapping tools such as a bread knife, a cold uncapping knife, a hot (electric or steam) uncapping knife, an uncapping plane, and a rotary wheeled hackler, but these do not have the dual beekeeping purpose.

Most beekeepers use ten frame hives or have supers that will hold ten frames. A beekeeper should use the ten frames where the brood is raised. In the supers that are used for extracting honey, a beekeeper should use ten frames the first season and then convert to ether nine or eight frames in the honey supers once the frames are drawn. This will allow the bees to pull the honey cells out further so it will be easier to uncap the frames and leave the beekeeper with a straighter frame.

Nail in frame spacer.

Frame spacer with long wedges.

Frame spacer with round pins.

There are frame spacers that can be fastened into the supers and if one moves their hives often, the spacers would be a good investment to help keep the frames in place. For a beekeeper that has only a few hives and doesn't move the hives, a hand held spacer would be a good tool to have. Some beekeepers have used only one spacer in the super to give them lateral movement of the frame at the other end of the super.

If the beekeeper uses 10 frames in the honey supers, he/she will find that the bees will produce a frame of honey where the cappings are practically flush with the top and bottom bars of the frame. If the hive is not plumb the finished comb may be recessed or tilted, causing low spots that are missed by the knife and a high spot on the opposite side of the frame.

Typically the beekeeper would use the tip of the uncapping knife to dig out the cappings. The result would be a mutilated frame that will continue to give the beekeeper uncapping problems. One of the tools used to help uncap the low spots was an ordinary table fork but it was time consuming due to its size. The cappings scratcher was developed and it could cover more area. There are several types of scratchers on the market and some of the early plastic models would break or lose their needles when one was trying to remove the caps from granulated honey or applying excessive pressure.

How one uses the scratcher depends upon their extracting operation. If you use the scratcher as the name implies and hold the scratcher vertical, you will notice that there is an abundance of wax cappings going into the extractor. If you have a small operation, your filtering system gets plugged up quickly. The larger extracting and filtering system allows the honey and wax from the extractor to be separated in a honey sump. Therefore a beekeeper running a small system should slide the needles of the capping scratcher just under the cappings and pull the cappings up from the frame. The cappings on the scratcher can be scraped off into a cappings or wax pail that you are using and the wax is processed later.

If the honey in the frame is granulated, you will have better luck uncapping the frame with an uncapping plane. Some honeys, like heather honey, are so dense that they don't lend themselves to be extracted, thus a beekeeper would be wasting their time using a capping scratcher. Some of the dense honeys need to be squeezed or pressed out of the comb.

Damaged capping scratcher.

Another use for the capping scratcher has been found in the inspection of *Varroa* mites. One can slide the needles of the scratcher into drone cells and pull out the developing larva. If you have *Varroa* mites, they are easily seen against the white brood. Drone cells are preferred by the mites due to the longer development cycle which allows more mites to also develop.

The capping scratcher is a very useful tool to have. BC

Jim Thompson is a long-time beekeeper and honey judge living in Smithville, Ohio.

All The Buzzz in...

Hello Friends,

Happy New Year! Be warm, be brave, and of course be very, very sweet.

Bee B. Queen

Bee B. Queen Challenge

Send us your moral for each of the stories below.

Morgan Dunbar, 10 OH

Yuvia Rodriquez, 8, FL

Isabel, CA

Fables Featuring Our Flying Friends

Ever heard of Aesop's Fables? Maybe you know the story of the Town Mouse and the Country Mouse or The Tortoise and the Hare? These animal fables with a moral, credited to Aesop, have delighted young and old for centuries. According to Aristotle, Aesop was a slave who lived in Greece over 2,600 years ago! Enjoy these fables adapted by Kim Lehman.

The Bees, the Drones, and the Wasp

Worker bees were gathering nectar from flowers. Some drones came along and insisted the hive was theirs. The workers and the drones argued back and forth until a wasp flew over to see what all the commotion was about.

The worker bees buzzed, "We built this comb. The hive is ours!"

"Oh no, oh no, oh no!" shouted the drone bees. "We built this comb. The hive is ours!"

"Wait one flying minute," said the wasp. "I have an idea. Each of you will go to an empty hive and build honeycomb. The group that makes comb like that found in this tree is the owner of this hive."

Diego Velázquez created his idea of Aesop in this oil painting from around 1639.

"Yes!" said the worker bees, "Let's do it!" But the drones said, "That is ridiculous. We will have nothing to do with such a plan."

"Bingo," said the wasp. "The workers are ready to build another comb while the drones refuse. That must be because the drones don't know how. The hive surely belongs to the workers."

The drones buzzed away very angry. The worker bees went back to building comb and collecting nectar and the wasp enjoyed the peace and quiet of the forest once again.

The Flies and Honey

One day, at the Farmer's Market, a man accidentally knocked a jar of honey onto the ground. Flies flew from all around to drink up the spilled sweetness. Their feet stuck fast to the sticky honey. They could not move. They were doomed. The flies said, "What fools we are!"

The Bear and the Bees

Once a bear was walking through the woods and came upon a fallen tree. Inside the tree was honeycomb. The bear licked his lips and slowly poked his paw around to see if the bees were home. Just then a worker bee, buzzing back to the hive after gathering nectar from flowers, saw the bear. She knew what he was after. Without missing a beat, she stung that bear on the tip of his nose and flew into the hollow log.

That bear, who was quick to anger, lost his temper and began to destroy that hive. The entire sw poured out of that tree and flew after the bear. The bear raced away as fast as his legs would carry him and dived into the lake to escape those bees.

... Bee kid's corner

Produced by Kim Lehman -www.kim.lehman.com
www.beeculture.com
January 2013

Mad Lib Mania

Create a silly story about Bee B. Queen. On a separate sheet of paper, write down a word for each number. For example, for number 2 you could write something like smelly or green. When you thought of a word for each number, read the story on this page inserting your words to make a crazy story.

1. Place
2. Adjective
3. Adjective
4. Adjective
5. Noun
6. Body Part
7. Verb – past tense
8. Verb – past tense

Bee Buddy

Emily Rannells is a very busy 11 year old living in New Jersey. Last year she did a science project on honey bees. Her classmates loved seeing all the beekeeping equipment. Watching the bees fascinates Emily. She swims, is a certified babysitter with the Red Cross and is involved in both 4-H and Cadet Girl Scouts. Since cooking is one of her specialties, her honey gets put to good use.

Emily's Crepe Recipe

Thank you Emily for sharing this recipe with us. By the way, she is also famous in the neighborhood for her omelets. Makes about six crepes using an 8 inch frying pan.

- 2 cups of flour
- pinch of salt
- just over 2 cups milk
- 3 eggs
- 2 ¾ tbsp. of melted butter

Emily Rannells enjoys caramelizing strawberries with honey for her crepes.

Put flour in a bowl and add the salt. Pour in milk while whisking, making sure to whisk out the lumps. Beat the 3 eggs in a separate bowl with a fork before adding to the flour and milk mixture. Cover with a towel for a half hour, and then mix in melted butter. Heat non-stick medium sized fry pan and pour one ladle full of batter, spreading evenly over pan. Watch carefully. Once evenly light brown, flip until lightly browned on other side. Slide crepe onto a plate, add your caramelized fruit or savory filling of choice at the bottom third of the crepe. Simply roll up, top with a little powdered sugar and/or honey! Now, devour!

Fruit Filling:
Some of the best fruit choices are sliced strawberries, banana, and blueberries. You can do them separately or combine for different combinations. Simply slice, place in a fry pan with honey and simmer until juicy.

Mad Lib Story

One day Bee B. Queen went on an adventure to the __1__. She was surprised to meet a __2__, __3__, __4__ __5__ on the way. It raised its huge __6__ and __7__ around and around. Being a quick thinker, Bee B. __8__ very, very quickly. And that is the end of that.

Beecome a Bee Buddy

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

Name
Address
Age
Birthday Month
E-mail (optional)

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

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

GLEANINGS

JANUARY, 2013 • ALL THE NEWS THAT FITS

NOT TRUE?

A comprehensive physical and chemical analysis of 74 New Zealand honeys finds 29 of 64 monofloral honey samples bought from supermarkets were not true to label based on pollen count.

Fewer than half the 26 manuka honeys tested were true to label.

Lincoln University PhD student Patchanee Boontaganon used standard industry analytical methods to confirm the floral identity and nutritional contents of the honey. She used analytical methods to quantify hydrogen peroxide content and antioxidant activity in honey.

Patchanee found the majority of the honeys had similar results except for manuka honey and manuka honey blends, which had much higher antioxidants, hydrogen peroxide and was a darker color than clover honey.

The New Zealand guidelines for mono-floral varieties of honey prepared by the Bee Products Standards Council contain the minimum percentage of pollen needed from a specific plant before a honey can be marketed as a named (mono-floral) honey.

There were difficulties because where other honeys, such as clover or pohutukawa, had generally accepted levels of pollen counts that qualified it as mainly derived from that plant, the minimum necessary percentage of pollen in a sample of manuka honey was still to be determined.

Edwards says the industry is intensively researching chemical markers to identify the source of the honey.

"Pollen is not the most reliable marker and one of the problems is, you've got to look at what else is flowering at that time – because that is what bees are collecting," he tells the newspaper. "It is next to impossible to find a pure sample of honey." – *Alan Harman*

AWARD WINNING PAPER THROWS LIGHT ON HONEY BEE PARASITE

A paper written by a team of researchers from the Universidad Nacional de Mar del Plata, Argentina, has been awarded the Eva Crane Award by the International Bee Research Association as the best paper published in its *Journal of Apicultural Research* during 2011.

Among the possible culprits of recent worldwide losses of honey bee colonies, one focus of attention has been the gut parasite Nosema. One species of this microsporidium, a type of primitive fungus, *Nosema apis* has long been known as a minor problem for honey bees, but more recently a different species, *Nosema ceranae* has been found widespread in honey bees.

The importance of *N. ceranae* remains controversial, with scientists in Spain linking it to extensive colony losses, whilst elsewhere, including in the UK, it seems to have little effect. One explanation for these differences might be that different regions have different strains of the organism, but environmental factors, such as the nutrition of the bee might also be important.

In the award winning paper, the scientists, led by PhD student Martín Porrini found that the development of spores of N. ceranae was affected by the food given to the host bee. They found that the disease developed more rapidly in bees fed syrup with pollen compared to bees fed syrup alone. In contrast, they found that the dose of spores fed to the bees to initiate the disease had little effect.

IBRA Science Director and *JAR* Senior Editor Norman Carreck says: "IBRA is pleased to have published this paper by a young researcher, which throws light on this enigmatic honey bee disease. More work is needed to understand the full implications of these findings, but they will undoubtedly influence strategies for dealing with the disease".

CUCKOO BEE DISCOVERED

Researchers have confirmed that species of "cuckoo:" bees found on the Cape Verde islands off the cost of west Africa are new to science.

Dr. Jakub Straka of Charles University in Prague and Dr. Michael Engel of the University of Kansas report in the journal *These bees*. The new species, like the more widely known cuckoo birds, invade the nests of other host bee species.

While the host is out collecting pollen for its brood, the cuckoo bee female enters the nest and deposits her eggs on the food resource. The cuckoo bee egg hatches and the immature promptly dispatches the host egg, leaving the pollen and nectar reserves for itself.

The Cape Verde cuckoos are mostly large, black-and-white species, almost zebra-like in their appearance. However, one species, *Chiasmognathus batelkai*, is quite small, merely .125 – .165 inches in length.

Despite its small proportions, *C. batelkai* is still the largest species of its genus, a group which otherwise comprises even more diminutive species. It appears as though at slightly less than 5 mm, *C. batelkai* is a remarkable case of island "gigantism", whereby founder effects or genetic drift lead to an increased body size in isolated populations during the initial stages of species origination and differentiation.

The researchers are now attempting to explore the diversity of the cuckoo bees' hosts and also to understand their evolutionary diversification across the archipelago.

Cape Verde is made up of 10 inhabited islands in the Atlantic Ocean about 360 miles off Africa.

Alan Harman

A male (above) and female (below) of Thyreus denolii, one of the new species discovered and named for the Genoese navigator Antonio de Noli, who discovered the Cape Verde islands around 1456.

IT'S STILL ABOUT THE WATER

Pumping groundwater for irrigation, drinking water and industrial uses is causing the sea levels to rise.

Researchers at Utrecht University in the Netherlands say this is because the water doesn't just seep back into the ground – it evaporates into the atmosphere or runs off into rivers and canals, eventually emptying into the world's oceans.

This water adds up, and the researchers say their study calculates that by 2050, groundwater pumping will cause a global sea level rise of about 0.8 millimeters (0.3 ins.) a year.

"Other than ice on land, the excessive groundwater extractions are fast becoming the most important terrestrial water contribution to sea level rise," says researcher Yoshihide Wada, lead author of the study.

He says in the coming decades, groundwater contributions to sea level rise are expected to become as significant as those of melting glaciers and ice caps outside of Greenland and the Antarctic.

Between 1970 and 1990, sea level rise caused by groundwater pumping was cancelled out as people built dams, trapping water in reservoirs so the water wouldn't empty into the sea, Wada says in a report in the journal Geophysical Research Letters.

His research shows that starting in the 1990s, that changed as populations started pumping more groundwater and building fewer dams.

The researchers looked not only at the contribution of groundwater pumping, but also at other factors that influence the amount of terrestrial water entering the oceans, including marsh drainage, forest clearing, and new reservoirs.

Wada and his colleagues calculate that by mid-century, the net effect of these additional factors is an additional 0.05 mm (0.0019 ins.) a year of annual sea level rise, on top of the contribution from groundwater pumping.

Wada says the last report of the United Nations Intergovernmental Panel on Climate Change in 2007 addressed the effect on sea level rise of melting ice on land, including glaciers and ice caps.

But it didn't quantify the future contribution from other terrestrial water sources, such as groundwater, reservoirs, wetlands and more, he says, because the report's authors thought the estimates for those sources were too uncertain.

"They assumed that the positive and negative contribution from the groundwater and the reservoirs would cancel out," Wada says. "We found that wasn't the case. The contribution from the groundwater is going to increase further, and outweigh the negative contribution from reservoirs."

The researchers estimated the impact of groundwater depletion since 1900 using data from individual countries on groundwater pumping, model simulations of groundwater recharge, and reconstructions of how water demand has changed over the years.

They also compared and corrected those estimates with observations from sources such as the GRACE satellite, which uses gravity measurements to determine variations in groundwater storage.

With these groundwater depletion rates, Wada and his colleagues estimate that in 2000, people pumped about 204 cubic kilometers of groundwater, most of which was used for irrigation.

Most of this, in turn, evaporated from plants, entered the atmosphere and rained back down.

Taking into account the seepage of groundwater back into the aquifers, as well as evaporation and runoff, the researchers estimated that groundwater pumping resulted in sea level rise of about 0.57 mm (0.022 ins.) in 2000 – much greater than the 1900 annual sea level rise of 0.035 mm (0.0013 ins.).

If things continue as projected, Wada estimates that by 2050, the net, cumulative effect of these non-ice, land-based water sources and reservoirs – including groundwater pumping, marsh drainage, dams, and more –will have added 31 mm (1.22 ins.) to sea level rise since 1900.

The new study assumes that, where there is groundwater, people will find a way to extract it.

Wada says some of his colleagues are investigating the limits of groundwater extraction.

"One way to decrease groundwater's contribution to sea level rise is to improve water efficiency in agriculture – grow more with less groundwater," he says.

Alan Harman

PESTICIDE USE GROWING IN UK

UK bees are under increasing threat, with a new report put today (Wednesday) saying pesticide use rose 6.5% between 2005 and 2010.

The environmental group Friends of the Earth says the report, "The Decline of England's Bees" carried out by experts at the University of Reading, found that two British bumblebee species have become extinct, solitary bees have declined in over half the areas they were studied in and managed honey bee colonies fell by 53% between 1985 and 2005.

As well as an overall rise in pesticide use, the report reveals an increase in insecticides that tend to be used on crops pollinated by bees – increasing the risk to them. The report also shows the use of herbicides can destroy important sources of food for bees.

The group cites data from the government's Food and Environment Research Agency showing that while trends in the use of pesticides have varied strongly between crops over the past five years, overall pesticide use rose 6.5% due to increasing treatment intensity on a number of crops including those most pollinated by bees such as oilseeds (+26%). Herbicide use has increased on oilseeds by 78%.

Current assessments of chemical use on bee health consider the effect on honey bees but do not include other bee species or the sub-lethal effects chemicals can have on different types of bee. Studies have also indicated that solitary bees could be more vulnerable to the impacts of insecticides than honey bees.

The number of managed honeybee colonies in the UK fell by 53% between 1985 and 2005 and wild honeybees are nearly extinct. Solitary bee diversity has declined in 52% of UK landscapes.

Previous Friends of the Earth research showed it would cost the UK an extra £1.8 billion ($2.8 billion) a year to hand-pollinate crops without bees.

Now the group is calling on Prime Minister David Cameron to produce a national bee action plan to tackle bee decline. It says Cameron should suspend the use of pesticides linked to bee deaths, make changes to the way impacts on bee health are assessed, and include targets for reducing use of pesticides.

The report, which also exposes other crucial areas where the government must take action in the national bee action plan to protect bees, says "perhaps the greatest shortcoming is the failure of government to fully recognize the importance and conservation needs of bees across the country."

The research shows that the loss of lowland meadows and hedges and the destruction of local wildlife sites has removed vital sources of food and nesting sites for bees. Farmers urgently need more support to ensure a bee-friendly countryside, planning policy must be strengthened to protect bee habitats and there needs to be a new focus on supporting bee species other than managed honeybees.

"It's shocking that pesticide use is still on the rise on the very crops that bees visit most when their use is being increasingly linked to the decline in bee populations," Friends of the Earth nature campaigner Paul de Zylva says.

"As well as an overdue investigation into the impact of pesticides on bees, the government must make urgent changes to the way we plan our towns and cities and farm our countryside so we can reverse their decline.

"To save our economy billions and give bees the best chance, David Cameron must commit to a national bee action plan."

Alan Harman

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"Sit down," I told my gal Marilyn, "and I'll drop a bomb in your lap."

"In that case take off your sunglasses," she said warily.

"It's a crazy idea," I continued, "but what if I sold the farm, and we just packed up and bought a bee outfit in northeast Brazil? Maybe it's the last frontier . . . "

She just about leaped out of her chair. "Let's go!" she cried.

That little darling! You have to appreciate a partner who'd jump off a cliff with you. I grew up in that part of Brazil. It has stifling heat, Africanized honeybees, unpredictable droughts, large poisonous snakes and violent desperadoes. I'm only 65. What are we waiting for?

We had the Colorado Beekeepers' winter meeting inside a gated community south of Denver out in the boonies. I'd never heard of this place. It's a haul from Peach Valley on the western slope. When I told Marilyn that the meeting was to be at the Roxborough Community Center, she said, "You're kidding! My sister Judy lives right down the street!" How fortuitous!

We got there the evening before the meeting for the mead tasting and a chance to meet speaker and bee researcher Dennis vanEngelsdorp from the University of Maryland. A genial Canadian in jeans and Converse All Stars with no laces, he throws in an "eh" now and then to remind you where he's from.

He was accompanied by his colleague the lovely Eva Forsgren, a honey bee researcher from Sweden. A blonde in black dress and heels, Eva was in Denver for an international barbershop chorus competition.

They'd spent the day hiking in the hills, Eva in her heels – the shoes she brought. Dennis may have worn shoelaces. He didn't say.

One of our members lives right there in the Roxborough community. When I asked her if the covenants allowed beekeeping, she replied that homeowners were permitted to keep two hives, but that electric fencing to keep out the resident bears was a no-no. Children might get shocked! My thought is that if you can train bears, you can train kids.

We always have a honey contest at the Winter meeting. This year there were some nice cash prizes. But I never win anything. I was a contest judge one year. I knew what kind of competition I'd be up against. I thought, why bother? But I forgot one thing.

In 2011 I harvested a tiny bit of truly remarkable honey on Aspen Mountain. I sold all of it to an Aspen hotel. The chef raves about it. He shipped samples around the elite chef world, to five-star review. He packed it in four-ounce, bee-embossed glass jars to give to the hotel guests. This Summer he gave me a couple of samples of my own 2011 honey. Never heated, to this day it refuses to granulate.

Best honey I ever produced. Exquisitely packed. It just didn't occur to me to enter it in the contest!

The next day, Dennis spoke about bees losses. For me, the takeaway was that we beekeepers tend to be set in our ways, and in our thinking. He compared us to fishermen who insist on using worms for bait, even when the guys who catch all the lunkers use frogs. In other words, we're not listening to each other or learning from each other!

He cited a survey in which beekeepers who didn't treat for mites had consistently higher Winter losses than those who did. That seemed like a no-brainer to me, maybe because I treat for mites. But Dennis informed us that 61 percent of the beekeepers surveyed didn't treat!

What are these people thinking? I know – people have reasons for what they do. Maybe they're willing to accept losses. Maybe they think that chemicals aren't the answer. Maybe they assume their bees don't have mites. Maybe they don't have time to treat. But the link between *Varroa* infestation and bee diseases is pretty clear. Mites weaken colonies, and viruses transmitted by those mites finish them off. This isn't just Dennis talking, or me. Open any bee magazine, and you can read the same thing. *Varroa* are pretty big, relative to a honey bee. Dennis said that if we had comparable-sized human parasites, they would be as big as dinner plates. Just imagine one perched on your back alternately spitting on you and sucking your blood! Would you ignore it?

He's not as concerned about the much ballyhooed neonicotinoid insecticides as he is about fungicides applied by commercial growers.

Whoa now! Our membership peppered him on that one. Dennis reminded me of a shortstop fielding hot grounders! But he's quick on his feet, and he has good hands.

Afterwards he scolded me for not following label directions when I told him that I was using half the recommended dose of Apiguard for mite control, and that all of a sudden it seemed to stop working on some colonies. I had my reasons for doing this the way I did: I use less, and put it between the supers, instead of under the inner cover, so that the bees' own heat makes the thymol work, even in cool weather. It always did the job before.

But me? Change my ways? Well, maybe. I guess I could check my hook. Maybe I should take off that night crawler and put on a big fat frog.

Ed **Colby**

Frogs For Bait

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