AUG 2009

Bee Culture

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INSIDE . . .

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Country bees were common, and suburban bees were rare. But now, whole yards of Clover are common city fare. So urban bees are growing, and urban keepers too. It's a grand thing to have happen, the many from the few.
(photo by Kim Flottum)

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

AUGUST 2009 VOLUME 137 NUMBER 8

FEATURES

DEPARTMENTS & COLUMNS

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Screened Bottom Boards

I enjoyed reading your June Inner Cover regarding chemicals. It is excellent philosophy pointed in the right direction. Your comments on taking *Varroa* mite counts has prompted me to ask you, and everyone else who ever counted mites, a serious question. Although my mite counting experience has been acquired using the Open Bottom Board (OBB)/sticky board system, the following information and recommendations apply equally well to any *Varroa* Mite counting system.

I. My Question: "When counting mites, do you count the live mites, dead mites and empty shells as three individual groups or do you tally them all together as one group?"

Answer: If your answer is that you tally them as one group then I submit that your data is invalid because your usable live mite count data has been corrupted by two confounding factors; the dead mite count and the empty shell count. The problem is probably compounded by including questionable material that looks like a mite. It is my contention that there are three independent factor groups to be found and considered when counting *Varroa* mites:

Group 1: Live Mites. This is the only group that provides correlation with the true mite population. To assure a valid count, It is important to follow a two phase schedule. The first phase is exposing the sticky board to a 24-hour exposure of the hive debris drop. The second phase is to remove the sticky board from the hive and then count the live mites within 24 hours to obtain a valid count. I have found that the live mites begin to die 24 hours after being entrapped on the sticky board with all the remaining live mites on the board dying before the end of the second 24-hour period.

Group 2: Dead mites. This group consists of any mite that is dead before it lands on the sticky board. Its source is primarily the fully developed female mites that have died either a natural death or starved to death because they lost contact with their bee host. I have never seen or recognized a dead male mite on the sticky board. The male mite dies from starvation before the comb cell is opened because he cannot eat. His mandibles are designed for procreation not nutrition. The only pictures I have seen of the live male mite were obtained by prematurely opening the comb cell while the male mite was still alive and in his prime. The male mite appeared to be a very fragile, flat and almost translucent blue/green creature. The male mite, along with dead female mites in various stages of development, may remain in the comb cell for an indefinite period going through various stages of decomposition. They are eventually removed by the house keeping bees and would then appear as part of the current population when the sticky board is in place gathering samples.

For many of my beekeeping years, I had considered the bee to be a very hygienic creature who would immediately and thoroughly clean each cell when it becomes vacant. I was half right, the bee is very hygienic but they do not completely clean an empty cell until they are ready to use it.

For example: When installing package bees I immediately and continuously monitor the mite count. Although dead mites and empty shells are found from day one on, it is rare for me to find LIVE mites during the first six weeks after installing the package. Any new mites that appear would be mites that have migrated into the hive. You can't have dead mites and empty shells without first having live mites. Where did they come from? The bees are cleaning the old comb! Habitually, I have saved the best frames of used, empty and fully drawn comb to supplement the frames of foundation when assembling a brood chamber for a new package bee, nuc, swarm, etc. The cells of the used comb look empty but are apparently loaded with debris, most notably dead mites and empty shells. I have also noted a significant surge in the dead mite and empty shell count early in the year, during Spring house cleaning time, and then in the Fall as the bees prepare space for the Winter stores.

Group 3: Empty Shells: The empty shells are primarily the exoskeletons that are shed when the mite molts several times while going through its development stage within the comb cell.

II. Your Quote: "Screened bottom boards it's a one way trip when those mites let go, and even though not many let go "

It has been my experience that the natural drop rate of mites, out of the brood chamber, is quite adequate without any enticement, work or expense on the part of either the beekeeper or the bees.

The key to success is to reduce (or preferably eliminate) any barriers between the brood chamber and the ground that will interrupt the journey The path to the ground must be equally free of obstacles for all three subjects of interest the mites, the hive debris and excess moisture. Any hive debris accumulation will collect mites and moisture. The hive debris accumulation will provide shelter for any mites that collide with the obstruction. Eventually the debris will have to be removed by the housekeeping bees. The housekeeping bees will then become a free bus ride, back to the brood chamber, for the sheltered mites. The moisture trapped by the debris will serve to speed up rotting and warping of any adjacent wood products. This leads us to your next quote.

III. Durability: Your quote: "If only all the manufacturers would make them [screened bottom boards] sturdy enough to last more than a couple of years before they bow out and fall apart"

My rebuttal to that quote is: "If only all beekeepers would use ½" mesh screen as an open Bottom

Board critter guard and remove all other barriers from the path to the ground they wouldn't have to worry about what the manufacturers are doing."

Unfortunately, there are quite a few influential members of the beekeeping industry still advising beekeepers to use 1/8" screen (Ref. *American Bee Journal*, February 2009, "The Classroom" by Jerry Hayes, Q&A item "Screen out unwanted intruders"). However, all is not lost. On page 145 of the same issue of *American Bee Journal*, there is a "Honey Bee Biology" column written by Dr Wyatt A. Mangum (another influential member of the bee industry). In his column, Dr Mangum shows pictures of wire hardware cloth on all six entrance holes of his Top-Bar hive. In the written part of the article, he identifies the pieces of screen as his "Mouse Guards." Assuming the entrance holes are one inch diameter, the wire mesh size is ½"

John G. Hoffman
Mount Holly Springs, Pa 17065

Log Cabin Beehive

I have built a unique Beehive that would be really interesting for *Bee Culture* readers to see. I am James Wesson from a small town in North Georgia. I am retired after working 30 years with G. E. I have found my hobby and craftsmanship to be very enjoyable in my retirement.

I am a beekeeper and gardener at heart. I have been beekeeping for years. I became interested in bees as a young boy with my dad having a few hives. We would also go with him to rob bees from trees. For smokers, we would roll old blue jeans on a stick. I had about 30 hives in the 1980s for about nine years. I sold out and got back into caring for bees in 2006. I now currently have 13 beehives. I wanted to build a beehive that would show different designs and creativity to beekeeping. Being a wood craftsman I started building bird houses that resembled a log cabin. The log cabin bird house had a great response from family and friends. I decided to build a beehive that resembled a log cabin.

I built the log cabin beehive walls using 1x1 strips and routed the corners. The dimensions were standard inside for the frames. The roof and wood stain was the same idea from my birdhouse. The long hours and hard work that went into building this log cabin bee hive was well worth it.

James Wesson
Summerville, GA

The log cabin hive, showing additional log cabin super and frames.

Bee Space

The rational for the dimensions of the Langstroth hive (and frames) have ranged from the arbitrary to the capricious. I write you to ask if anyone, in essence, has ever asked the bees. Has anyone ever hived swarms in cavities of various dimensions?

These are some of the questions I have:

1. Do the bees prefer to orient their combs in a particular direction?
2. Does the entrance affect comb orientation?
3. Is there a preferred ratio between comb width and length?
4. Is there a preferred space between combs?
5. Are cell sizes consistent throughout the comb?
6. Is there a preferred location for drone brood?
7. Is there a limit to the area for brood rearing?
8. What else might we learn if the above questions are answered?

Richard W Anderson
Donora, PA

Editor's Note: *These are all excellent questions, but to answer them all would fill a book. In fact, it does. Dr Tom Seeley, Cornell University wrote one of the books – The Wisdom Of The Hive, available from Cornell University Press. A newer book, The Buzz About Bees by Jürgen Tautz also covers much of this information. Roger Morse, also from Cornell with Dr Seeley once gave bees their choice of cavity sizes. The one they liked best was very nearly the volume of a deep super*

Laying Workers

I wish to thank you for the excellent articles and letters which contain such timely and relevant discussions on the real issues which today's beekeepers are dealing with. I just got my June issue of *Bee Culture* and was glad to read Dave's letter on CCD Update. This certainly opened my eyes on what has been taking place in my little beeyard.

I, also, appreciate the article last month dealing with laying workers. This problem ran rampant in my middle hive. I replenished the population with multiple injections of brood frames from other hives and tried desperately to requeen; all to no avail. After reading the article in *Bee Culture*, I promptly went out and dumped (shook) the frames and hive bodies on the ground and let the homeless bees find shelter where they could. It appeared that most were accepted into my remaining colonies, and I am now running with one less hive and a lot less worries.

Greg Carey
California, MD

Time For Change

I have just finished reading your gutsy editorial in the June, 2009 issue urging us to change the way we do beekeeping and I couldn't agree with you more. As one of a growing legion of beekeepers who realized that I was losing about as many bees when I treated as when I didn't, I applaud your courageous leadership on this issues. Thanks for saying in print what many of have been saying in private.

Dan O'Hanlon
President WV Queen Producers

Hiding The Bees

Just finished reading May 2009 issue of *Bee Culture* and got very interested in the article on "Hiding The Bees." This problem faced me many years ago when I was going to Stockton High School in 1936-40. Our agriculture Teacher was J Mitchell Lewis said he would talk about any subject of interest. One day somebody wanted to know about bees and this is where I developed a liking for bees.

My family and I lived in a subdivision with lot sizes about 40' x 125' size. Not much room for beekeeping. My father built a sleeping porch on the rear with a sloping shed roof and this is where I kept my bees. The house was old and high off the ground to stay out of flooding in the Winter The hives were about 12 feet off the ground and the bees stayed above that. They never bothered the neighbors. Never had a bit of trouble.

The picture shows the location of my bees. When I went into the Navy in 1943, I had to teach my father how to take care of them.

Harley B. Crawford
Santa Rosa, CA

INNER COVER

This is mostly for those of you who are relatively new at this. A couple of years or less into the beekeeping game, maybe three but certainly not more. If you've been around for more than that you don't need to read any further (unless you believe, like many that every word of this monthly contribution is golden and shall not be ignored).

It has to do with how things die. Often suddenly, violently, and without cause or reason. But just as often, things die for very good reasons or for very good causes...justly and humanely, quickly and painlessly and without fear And then, sometimes things die just because. Because it was the wrong place at the wrong time...or just because something could make it happen. Living things die. Bees are living things.

So are rabbits.

A couple of months ago perhaps you read an article on these pages by Jennifer Berry about helping wounded turtles. I was with her one morning when she stopped to pick up a turtle that was attempting to cross a busy road...just to get to the other side I guess...so it wouldn't get squished. Turtles are tough, but it's no contest when they go up against a four-wheel-drive pick-up at 70 miles per hour Truck 1, Turtle 0. Jennifer has a soft spot for those shelled creatures.

Well, Kathy has a soft spot for all things soft and furry Kittens and puppies, baby birds and, up to now, even baby rabbits.

We planted a garden this year Actually we've planted a garden the past two years, but time, tide and weeds wait for no man or gardener and by the end of the season all that remained was a tall, brushy spot in the yard. Garden is not how you would have described what was left, and finding produce in the midst of that jungle was a safari.

But this year we were ahead of the curve with fertilizer applications, planting, weed control and watering. This year it was going to work. The zukes, cukes, Winter and Summer squash were taking off like gangbusters, and the corn was more than knee high by the fourth of July The tomatoes were full of blossoms and tiny fruit, and the peppers oh, oh. The beans oh, oh. Sunflowers the same.

Something evil this way came and ate the pepper plants right down to the last leaf along with the blossoms and fruit and the promise of delicious stuffed peppers this Winter And some evil thing came and ate the beans right down to the stems leaving only a parade of tiny green sticks in the ground, military straight but leafless and inert, deader than stone everything gone, everything destroyed. Everything in the bean row was dead. Everything in the sunflower row was dead. Everything in the pepper row was dead. All during a single, sleepy, warm and quiet night. Gone. Dead.

And it wasn't deer or ground hogs, wild pigs or the neighbor's escaped chickens that caused all this mayhem it was a family of furry fuzzy, cute and cuddly rabbits that did in a major part of the garden. Mom and dad and all the kits. Maybe an aunt or uncle came by too, just for a snack, to see the kids and maybe just a little bit more, as long as we're here, you know I saw them just as they were pushing away from the table. I watched as they finished devouring the fruits of my labor Of Kathy's labor Of nature's labor Lunch. All our garden was, was a big green, fresh, healthy, hearty lunch.

And, you know, those beans and peppers were resistant to a whole slew of diseases and pests, rots and rusts and mildew and bugs. But it wasn't one of those that killed my harvest plans. So far, it seems there's no variety resistant to or tolerant of a munching bunny

Now I have a neighbor who isn't impressed with furry and fluffy and soft and cuddly He's lost too many gardens, (he has four or five in different places every Summer), in his 80 plus years to be at all impressed with cute. And he plays for keeps with things that go munch in the night. Live traps mostly, but leg traps and head traps keep the things that eat lunch in the night in check. And electric fences, too. Population control is what he calls it. He doesn't have a problem with deer or rabbits, raccoons or groundhogs. He has the gardens he wants without any interference what so ever But he has walls to protect them, and a security system that is infallible. And very often fatal.

When our peppers and beans went missing I wandered over, across the road to where he was weeding and watering and worrying, out in his very perfect garden. No weeds, no rabbits, no problems.

So, I says rabbits. OK, he says, I'll get 'em. We've been talkin' like that for so long we don't hardly have to talk at all any more to have a whole conversation. And in a couple days some combination of leg traps, live traps or just plain fear and intimidation made that rabbit family disappear – mom, dad, kits, aunts and uncles everyone. Peter and company were history They had moved on, or been moved on. I didn't ask how, he didn't tell. Bring that wax, I'll melt it down, I says. OK, he says. Done deal.

Needless to say, Kathy's attraction to all things cute and fuzzy was somewhat diminished, especially after she found that all the flower buds on the Rose Of Sharon disappeared the same night dessert, I figured, after all that greenery That the rabbits are gone is a good thing in her eyes, but how they got that way shall remain an unknown

So, what does this have to do with keeping bees for not very long?

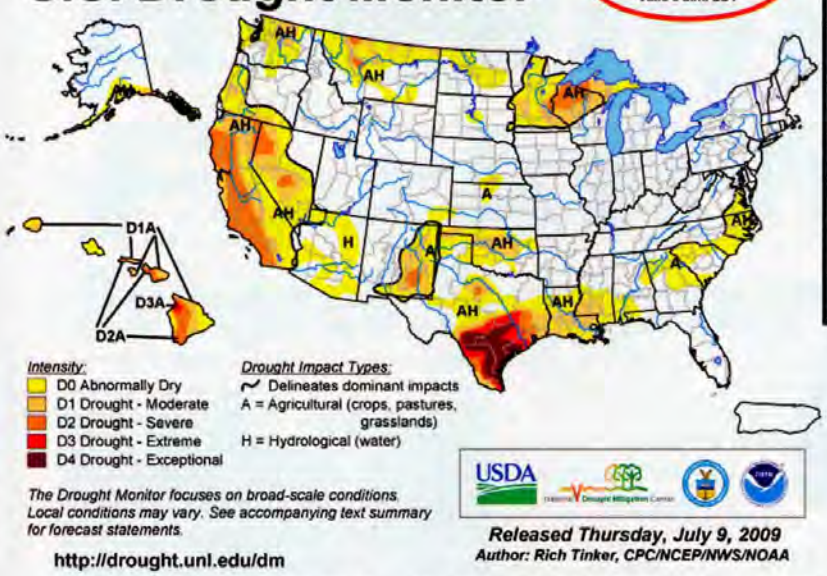
Bees die, too. Like rabbits and plants. Sure, some die everyday after a lifetime of service to their society

Continued on Page 76

Rabbits

AUGUST – REGIONAL HONEY PRICE REPORT

U.S. Drought Monitor



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

Released Thursday, July 9, 2009
Author: Rich Tinker, CPC/NCEP/NWS/NOAA

Reg.	Too Wet	OK	Too Dry
1	60	20	20
2	83	17	0
3	80	26	0
4	54	38	8
5	0	0	100
6	50	17	33
7	78	11	11
8	50	50	0
9	0	0	100
10	50	50	0
11	46	23	31
12	0	56	19

Regional weather conditions in June, 2009.

What a difference a year makes, at least in much of the U.S. Last year it was a drought centered world… and this year is almost the opposite. We asked our reporters how was the spring weather this year, and then how had that weather affected what they were doing. Here's the weather report…For excellent weather reporting, crop information, growing degree day information in your area, and almost anything agriculture…go to www.nass.usda.gov for a wealth of information, and you can go to http://www.drought.unl.edu/dm/monitor.html for specifics on drought monitoring maps. You'll find what you want there.

Reporters were asked if it was too wet, just right or too dry where they were during the spring buildup period in their area. Across the country, 50% said it was too wet this year, 27% just right and 23% thought it was too dry…a marked change overall from last year. However, this certainly varies by region as the chart shows. Too wet this year in the northeast, mideast and southeast, but dry in Florida. The Midwest and gulf states wet to OK, Dry in Texas, so so in the Plains states and Mountain states, but only OK to dry on the west coast, especially in the valley in CA.

The drought monitor map included here shows that since June Florida has seen relief from the dry but parts of the upper Midwest could use some moisture, at least as of mid July.

Overall, the spring weather caused 59% of our reporter to have to feed this year, and only 42% made a spring crop of honey. Because of this, only 17% expect an above average crop this summer, and 43% expect it to be below average.

Pest pressure so far this spring has been a bit below average to just about what everyone expects, and overall, 75% or our reporters see their bees doing about what they should be doing, but a little more would be good.

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	1.52	1.65	1.52	1.80	1.50	1.52	1.48	1.52	1.40	1.50	1.41	1.68	1.40-1.80	1.54	1.56	1.45
55 Gal. Drum, Ambr	1.41	1.45	1.41	1.41	1.45	1.29	1.50	1.41	1.30	1.41	1.31	1.58	1.29-1.58	1.41	1.41	1.23
60# Light (retail)	120.00	148.00	130.00	113.75	139.42	128.33	150.00	123.75	139.42	139.42	133.50	150.00	113.75-150.00	134.63	133.29	123.96
60# Amber (retail)	120.00	138.50	130.00	111.75	135.59	116.00	141.00	123.33	100.00	135.59	128.20	149.00	100.00-149.00	127.41	127.20	115.55
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	52.08	65.32	45.60	49.00	65.22	43.25	42.90	65.22	65.22	45.36	44.40	88.00	42.90-88.00	55.96	61.76	54.68
1# 24/case	65.52	85.42	72.00	71.40	86.54	78.40	72.72	64.71	86.54	97.00	80.30	98.80	64.71-98.80	79.95	80.55	72.97
2# 12/case	69.72	74.72	66.60	60.00	76.01	67 13	65.76	78.00	50.00	75.00	64.10	82.20	50.00-82.20	69.10	70.44	65.09
12.oz. Plas. 24/cs	64.32	79.18	50.40	73.70	85.50	68.67	60.82	57.48	87.00	57.60	59.24	70.15	50.40-87.00	67.84	65.31	58.96
5# 6/case	85.40	83.99	78.00	67.25	82.37	75.00	74.52	81.60	82.37	80.40	70.85	91.25	67.25-91.25	79.42	79.60	72.90
Quarts 12/case	100.40	121.50	100.40	101.52	100.40	85.78	92.00	85.84	102.12	107.94	93.96	117.00	85.78-121.50	100.74	102.77	96.60
Pints 12/case	68.42	76.48	68.42	69.00	68.42	50.43	65.50	58.56	66.00	69.30	56.10	68.00	50.43-76.48	65.38	63.08	57.31
RETAIL SHELF PRICES																
1/2#	2.88	3.27	3.59	3.39	2.29	3.16	2.86	2.64	2.09	2.75	2.77	5.37	2.09-5.37	3.09	3.38	2.87
12 oz. Plastic	3.25	4.09	3.86	4.02	2.99	3.92	3.38	3.83	3.77	3.30	3.82	4.41	2.99-4.41	3.72	3.78	3.61
1# Glass/Plastic	3.83	4.84	4.63	4.72	4.25	4.95	3.98	4.59	3.36	4.72	4.89	5.95	3.36-5.95	4.56	4.68	4.55
2# Glass/Plastic	8.38	7.43	8.24	7.56	6.69	7.42	7.32	7.41	5.75	8.09	7.96	8.75	5.75-8.75	7.58	7.55	7.29
Pint	7.62	7.42	7.62	6.49	5.79	5.87	6.81	6.44	9.25	8.17	6.38	9.00	5.79-9.25	7.24	7.46	6.93
Quart	12.34	12.65	12.34	10.25	7.89	9.46	8.75	10.66	14.75	14.05	10.48	15.00	7.89-15.00	11.55	10.28	10.99
5# Glass/Plastic	17.00	15.99	18.45	14.50	19.74	16.50	16.92	19.00	19.74	16.04	17.97	19.50	14.50-19.74	17.61	17.15	16.16
1# Cream	5.25	6.04	7.99	5.33	5.95	4.80	4.67	5.32	3.29	5.19	5.88	7.58	3.29-7.99	5.61	5.67	5.23
1# Cut Comb	5.50	4.97	6.50	6.25	6.42	5.50	7.08	5.50	6.42	7.00	10.00	9.00	4.97-10.00	6.68	7.17	6.48
Ross Round	6.97	4.65	6.50	5.00	6.97	5.50	6.33	7.00	6.97	6.97	7.10	8.50	4.65-8.50	6.54	6.49	6.15
Wholesale Wax (Lt)	3.67	3.69	3.25	2.88	3.66	3.96	3.50	3.67	4.00	4.00	2.96	3.67	2.88-4.00	3.57	3.92	3.05
Wholesale Wax (Dk)	2.00	3.24	3.25	2.67	3.47	3.81	2.75	3.00	3.00	3.47	2.66	3.75	2.00-3.81	3.09	3.59	2.88
Pollination Fee/Col.	80.00	82.50	67.50	46.20	87.34	52.00	50.00	57.50	87.34	87.34	55.00	111.00	46.20-111.00	71.98	68.85	85.44

The $4.1 Million Colony Health Grant – *1 Year Later*

Kim Flottum

It's been a year and a month since USDA CSREES (Cooperative State Research Extension Education Service) awarded a $4.1 million grant to a group of university researchers for the express purpose of solving the current honey bee health problems confronting the beekeeping industry Without actually nailing it down, this was a project to look into the current Colony Collapse Disorder malady and, over four years, find out what was going on. But at the same time the grant was to fund an extensive education program for beekeepers, and to develop as much information as possible so beekeepers could keep their bees healthy, and had a place to go for questions and answers. Moreover, 25% of the funds were to go to study non-apis pollinators, such as bumble bees, alfalfa leaf-cutting bees and the like. To date, this is the only government money to be distributed to beekeeping researchers to study this problem other than normal budgetary funds to keep the regular USDA projects up and running. These include several special projects funded some time ago, and the Bee Labs, of course.

Keith Delaplane

So what's happened in a year? I'm glad you asked, because I wanted to know too. So I ventured to the University of Georgia in Athens to visit with Dr Keith Delaplane, the leader of this large and varied group studying this large and varied problem.

According to Dr Delaplane the grant is doled out in four annual increments of roughly $1 million, pending satisfactory progress on that year's work, not in one lump. He suggtested that readers visit **www.beeccd.uga.edu/** to view the objectives, work plans and time table for deliverables.

In this first year each of the cooperators in the program have hired the people they need to work with or brought on board the grad students who will do the work or the post-docs who will assist in the project. Probably the biggest accomplishment so far, said Dr Delaplane, is the establishment of the seven stationary apiaries to monitor honey bee health and the environment. These apiaries, consisting of 30 colonies each, are in Maine, Florida, Pennsylvania, Minnesota, Texas, Washington and California. Each is administered by one of the researchers and will be managed using the techniques particular to their respective locations bees in Minnesota are not managed on the same calendar or with the same methods as those bees in Texas, for instance. But each area does have best management practices that reflect these differences, and those will be followed.

However, one constant is that each colony in each of these apiaries will be sampled once a month for the duration of the study to look at what's going on inside. Samples of bees, honey and wax will be taken, and measurements of bees and brood will all be taken routinely The samples will go to a lab at Penn State to look for viruses and *nosema* disease, to the University of Washington to count nosema spores and tracheal mites, and to the Connecticut Agricultural Experiment Station to look at the pollen and wax samples for residues of agricultural pesticides. At the same time, USDA scientists will be taking identical samples, and doing identical counts from a series of migratory beekeeping operations. Samples and data will be identical from each apiary and each migratory operation, and at the end the mountain of data will be easily comparable and very useful, said Delaplane.

Because this grant also covers non-apis bees (that is, bees that are not honey bees) identical samples will be taken from managed non-apis bees at each of the apiary sites. Scientists are looking for cross infections or other relationships.

Other non-apis projects include looking at increasing the efficiency and reducing the stress of managed bumblebees when used for pollination. The effects of the neonicitinoid pesticides on non-apis bees are also being studied, and especially the sub-lethal effects and any effects from residues. This should be interesting.

Meanwhile, the Extension and Education part of this has moved right along, and in July the USDA adds to the existing **eXtension.org** website a large section on Bee Health. It is to be a one-stop shopping experience for agricultural information. The honey bee health section is housed and administered from the University of Tennessee. All of the information that goes on this web page, the bee page included, is well-researched, refereed work, with oversight by a large team of honey bee scientists. There will be a Frequently Asked Questions section, an Ask The Expert section, Best Management Guides section and more. All coming from the Bee Health Community group. This effort will be federally supported, but all states will contribute with funds from their individual extension budgets. This may, over time I imagine, erode the personnel in each state's Extension core. Unfortunate, but at least there won't be a vacuum left behind. To view more, visit www.extension.org, and be sure to check out the Resource Areas. The Bee Health site was due to be launced in July

so it should be there now.

Parts Of The Study

- **Investigating the genetic makeup of the *Varroa* mite**

University and USDA scientists in TX and IN are looking at this from the molecular level, looking for those genes responsible for the *Varroa*-sensitive hygienic behavior This trait allows bees to detect larva in a capped cell that have *Varroa* and remove them. This keeps the mite's populations in check without chemicals. Moreover once identified queen producers will be able to certify that their bees do have the gene and should exhibit that behavior This will definitely be a plus for those queen producers looking to provide quality queens to their customers.

- **Understanding honey bee viruses**
  Scientists at Penn State are doing cage studies with bees looking at the effects of individual viruses, and then the effects of different viruses combined.
- **Untangling the health effects of *nosema* parasites**
  Many insect species suffer from different species of nosema one of the scientists is looking at this disease, while other scientists at Michigan and Kentucky are trying to produce honey bees with only a single problem nosema apis, or nosema ceranae, but not other problems at the same time. Once isolated, they will then look at these diseases in combination with viruses, and combinations of viruses.
- **Understanding the effects of miticides (pesticides)**
  Lab studies looking at the effects of individual and the synergism of the all of the miticides beekeepers use in a hive are being conducted in Nebraska. Along the same lines, effects of these chemicals on queen viability and drone sperm production are being studied.
- **Investigating the effects of farm pesticides**
  Ag chemicals have been blamed for much/some/all/none of colony collapse disorder – take your pick. But that should be answered by studies looking at the effects of these on larvae and nurse bees. That should be interesting, but the funding for this particular project is still on hold.
- **Rearing healthy queen bees**
  Think Globally, but act Locally is kind of the theme for the work being done in Washington and New York. Genetic diversity seems to be lacking, at least in some operations due to the small number of commercial beekeepers producing queens. Thus, more queen producers are needed and they should be more localized and regional rather than all coming from a central location, goes the thinking. Researchers will be setting up educational programs to develop local and regional queen production operations to capitalize on the diversity of a lot of regions. But first they have to find some...that's what they are doing now

So, after year one, seven stationary apiaries are set up and running, along with migratory operations being sampled, a host of research projects are up and running, or are almost there, and the eXtension web page, loaded with tons of Honey Bee Health Information is due to be launched next month. $4.1 million, one year later

Thoughts on EPA

Beekeepers have lobbied for years for change, but had pretty much given up, and given in. CCD reopened this door, as has new leadership at EPA. Thad Box, a columnist for The Western Farmer Stockman speaks to the problem. And finally, the EPA is responding.

The scrutiny that agricultural pesticides have received of late due to the unconventional problems beekeepers have been experiencing for the last three years has reached epic proportions. Finally. The Environmental Protection Agency is charged with administering those compounds, their applications, and those that apply them. EPA absconded from this responsibility years ago, leaving the oversight in the hands of individual state Departments of Agriculture.

EPA is also charged with securing adequate testing of new compounds to assure users they are safe and effective. This, too, has been handed over to the money-changers in the temple – the very organizations that produce and sell these products.

It is generally accepted that toxic bank loans caused our financial system to collapse. Now it appears that toxic substances are causing collapse of a whole host of pollinators that keep natural systems functioning efficiently And the collapse of both the financial and biological systems are part of a larger system failure.

Beginning in the 1990s, beekeepers began to suspect the systemic insecticide imidacloprid for death of bees. This is a product that is taken up by plants and becomes systemic, that is it is stored in and moves through the plant system. Once the chemical is in the nectar and pollen of the plant, nothing can protect pollinators who gather the poisoned food.

Imidacloprid a suspect

When imidacloprid was introduced in Europe, French beekeepers claimed it produced "mad bee disease." France banned its use on major crops such as sunflowers and corn. Studies were made; results are inconclusive. Beekeepers claim it kills their bees. The chemical companies say it is safe. In America the EPA allowed use of the insecticide, primarily on data supplied by the manufacturer

There are no scientific studies that show conclusively that systemic insecticides cause bee colony collapse. But studies show imidacloprid is highly toxic to earthworms, birds, bees, some fish and other non-target species.

The National Honey Bee Advisory Board, representing both the American Beekeepers Federation and the American Honey Producers, presented case studies from North Dakota, Minnesota, Texas, Florida and California that circumstantially link imidacloprid to bee Colony Collapse Disorder They want the pesticide banned in the United States.

RESPONSE

U.S. EPA announced the formation in July of a "pollinator protection team" to determine the role of pesticides in the disappearance of honey bees to a mysterious illness, colony collapse disorder.

EPA and the Agriculture Department have narrowed the potential causes of the disease to six: new and re-emerging pathogens, pesticides, habitat loss, pests that infest bee hives, commercial bee management practices and nutritional stress.

The agencies do not understand the importance of each factor and how to stop the die-off, which began in 2006.

EPA said it would begin by re-evaluating pesticide testing requirements. Traditionally, pesticide manufacturers submit data on the short-term effects of a chemical on individual bees, but the agency is reconsidering that approach in favor of trying to gain a more complete picture of the different ways pesticides might affect bees throughout their lives.

The team will examine current regulatory requirements and compare them to what is known about toxic effects on honey bees, with an eye toward developing more comprehensive testing protocols. It will also focus on risk management approaches, EPA said, in an effort to mitigate potential risks, and encourage international research collaboration.

For more information on this new EPA approach see www.epa.gov/pesticides/ecosystem/pollinator-protection.html.

Base rules on objective studies

Imidacloprid is available for insect control on roses, lawn, vegetables, fruit trees, ornamentals and crops. It is available on the Internet for treating termites, fleas on pets, household pests – almost anything you can imagine.

Organizations take extreme positions ranging from it screws up everything (Sierra Club of Canada) to that it is safe and the savior of the farmer (Bayer's "expert overview"). The scary point is that we do not have good studies to show the chemical's effect on the broad pollination system.

Beekeepers with NHBAB ask, "How did we find ourselves at a point where an extremely dangerous chemical compound has come into such widespread use, threatening the very existence and viability of the pollination framework of the country?

The answer is simple: deregulation.

The same concept that precipitated our financial collapse has precipitated an environmental collapse no less serious. At the same time that financial institutions were being given a free reign to regulate themselves on the naïve assumption that industry knew best, pesticide regulation was being turned over from EPA to industry on the same assumption.

For the past eight years our government has been of industry, by industry and for industry It put foxes in charge of every henhouse. It tolerated toxic loans, unsafe drugs, melamine-adulterated food, polluted air, contaminated water, kid-killer toys – the list goes on. It is time to go back to making rules based on objective studies done by independent scientists. We must re-establish government of the people, by the people, for the people.

Reprinted Western Farmer Stockman
Written by Thad Box

a closer look

IMPACT OF MITES ON QUEENS, WORKERS & DRONES

Clarence Collison

Some things we put in our hives to combat mites are worse than the mites.

Following the introduction of *Varroa* mites into North America, beekeepers have relied heavily on chemical miticides to suppress mite infestations in their colonies. Overuse of tau-fluvalinate and coumaphos, sold as Apistan® and Checkmite+™, has resulted in widespread resistance to the chemicals in *Varroa* mites, as well as a build-up of these chemicals in hive materials. Tau-fluvalinate is a synthetic pyrethroid and its mode of action is to alter the voltage-gated sodium ion channel found in the lipid membrane of nerve and muscle cells. The disruption of this channel leads to hyperactivity and death. Resistance in mites is believed to have resulted from a mutation in the voltage-gated sodium channel which prevents tau-fluvalinate from binding to the membrane (Wang et al. 2002). Coumaphos is an organophosphate insecticide, a nerve poison, which inactivates acetylcholinesterase in the synapses of nerve cells. Both of these miticides are lipophilic, which implies they are absorbed into the wax component of the hive. They remain active for many years, and have the potential to build up so that bees are exposed to high concentrations of tau-fluvalinate and coumaphos simultaneously (Johnson et al. 2009).

Honey bees are extremely sensitive to many pesticides. Although these miticides were chosen for their low toxicity to bees, the mechanism of tolerance in honey bees is not entirely understood, especially for coumaphos. It is believed that rapid detoxification of tau-fluvalinate in honey bees is mediated by cytochrome P450 monooxygenase enzymes (P450s). Organophosphates, such as coumaphos, are also detoxified by P450s, but a more deadly metabolite of coumaphos, coumaphos oxon, can be produced through P450 activity Johnson et al. (2009) showed that coumaphos and tau-fluvalinate may have a synergistic toxic effect on honey bees based on the competition for detoxifying enzymes. In a laboratory study, they found a large increase in the toxicity of tau-fluvalinate in three-day-old bees that had been previously exposed to coumaphos, and a moderate increase in the toxicity of coumaphos in bees treated previously with tau-fluvalinate. These results suggest that honey bee mortality may occur with the application of otherwise sublethal amounts of miticides when tau-fluvalinate and coumaphos are simultaneously present in the hive.

Since the early 1990s, many commercial and sideline beekeepers have complained about vitality and reproductive problems in queens. Unfortunately, these problems have not been resolved, and poor queen performance is still an obstacle to beekeepers. The problems associated with maintaining productive queens have coincided with increased use of chemical miticides for parasitic mite control (Sanford 2001). Frequent complaints from beekeepers prompted several researchers to examine the potential miticide effects on the reproductive physiologies of queens and drones.

"Queens treated with high doses of fluvalinate weighed significantly less than the low-dose or control groups, but otherwise appeared normal."

Haarmann et al. (2002) conducted research on the potential impacts of fluvalinate and coumaphos on queen viability and reproductive health. Queens were reared in colonies that were treated with high (two strips), low (one strip), or no doses of either fluvalinate or coumaphos. Pre- and post-treatment samples of bees and comb wax were taken to establish a baseline and a final concentration of the miticides. Several weeks into the study, queen assessments were made for overall weight, ovarial weight, and sperm number in the spermatheca. Queens treated with high doses of fluvalinate weighed significantly less than the low-dose or control groups, but otherwise appeared normal. The highest concentrations of fluvalinate detected in post-treatment samples were found in the high-dose group, verifying the persistence of the miticides in comb wax. Groups treated with just a single strip of coumaphos for more than 24 hours did not rear out most of their queens. Of those queens that were successfully reared, several showed sublethal effects of coumaphos

"Another aspect of drone reproductive fitness that may be affected by miticides is sperm viability."

poisoning, including morphological abnormalities and atypical behavior Also, queens exposed to coumaphos weighed significantly less and had lower ovary weights than untreated queens. The highest post-treatment coumaphos concentrations were observed in the queen cells and wax of the high-dose group.

A study by Currie (1999) assessed the fluvalinate-impregnated strips known as Apistan Queen Tabs™ for efficacy and harmful effects on caged queens and workers. When queens and attendant worker bees in Benton cages were exposed to Queen Tabs (1% fluvalinate a.i.) for more than three days, significant mortality in worker attendants and sublethal effects in queens were observed. Exposure for seven days caused significant mortality in queens. The position of the tabs in the cage did not significantly affect worker survival, although there was a trend toward higher survivability in cages where the queen tab was placed under the screen rather than on the floor of the cage. Colonies headed by queens that had been exposed for three or seven days showed no significant difference in the production of supersedure cells relative to colonies headed by unexposed queens, although there was a trend toward higher production of supersedure cells in colonies headed by fluvalinate-treated queens. However, the high queen mortality demonstrated by a seven-day exposure to Queen Tabs warrants caution to queen breeders when using fluvalinate during queen shipping.

In another study, the effects of a range of doses of coumaphos and a single high dose of fluvalinate on developing queens were investigated (Collins et al. 2004). Young larvae were transferred into beeswax cups containing known concentrations (0 to 1000mg/kg) of coumaphos or fluvalinate. The cups and larvae were placed in queenless colonies for rearing; 10 days later acceptance was determined by recording the number of mature queen cells. The mature queen cells were placed in mating nucs, and the mated queens were later collected and either introduced to mating colonies for six months of observation, or dissected to determine mating success. Of individuals in the coumaphos-treated groups, those queens exposed to 100 mg/kg coumaphos suffered greater than 50% mortality during the larval stage, and only one individual of the 1000 mg/kg group was reared to maturity The group receiving a high dose of fluvalinate (1000 mg/kg) also had a significant reduction in queen rearing. The greatest impact of coumaphos was observed in the acceptance and rearing of queen larvae, as well as pre-emergence pupal weight.

Miticides are obviously causing problems with queen viability, but they have also been shown to reduce drone survival (Rinderer et al. 1999) and production (De Guzman et al. 1999), body and mucous gland weights (Rinderer et al. 1999) and spermatozoa production (Fell and Tignor 2001). Sylvester et al. (1999) found that the drones that survive to mating age from *Varroa*-infested or fluvalinate-treated hives were equally competitive to control drones, but that larval mortality was high in both mite infestation and chemical treatment groups. Sister virgin queens from a single queen mother were naturally mated to three types of drones coming from either Apistan®-treated, *Varroa*-infested or untreated colonies at an isolated mating area (Marsh Island, LA). The experiment was designed to determine if mature drones from each of the colony treatments have equal probability of mating and producing offspring. Through the use of molecular markers, it was found that the ratio of workers descending from each type of drone was the same as the ratio of parental drones available for mating, about 90 drones per queen. However, this might not be the case if insufficient drones are available for mating due to high larval mortality from fluvalinate treatments.

Another aspect of drone reproductive fitness that may be affected by miticides is sperm viability. Burley et al. (2008) conducted an experiment to compare the viabilities of stored sperm from drones exposed to cou-

maphos, fluvalinate and the increasingly popular miticide Apilife VAR® (thymol, eucalyptus oil, menthol a.i.). Drones were reared in 12 colonies: three colonies for each miticide treatment and 3 control colonies. Miticides were administered in accordance to the product label. Approximately 25 drones from each colony were collected as they emerged from the hive and semen was extracted and stored at room temperature in glass capillary tubes. After six weeks, the semen was analyzed for viability using fluorescing stain. Only the semen from coumaphos-exposed drones failed at six weeks time, but all other treatment groups had viable semen not significantly different from the control group.

The urgency to develop effective miticides to replace tau-fluvalinate and coumaphos has led to the discovery of simple and more "natural" miticides, such as thymol, formic acid and menthol, but even these compounds need to be scrutinized before they are recommended for use in beehives. For example, De Guzman et al. (1999) found that formic acid treatments reduced drone production and survival over a period of 10 days when compared to controls. Many eggs were removed from drone combs during the first one to five days of treatment by the bees. All colonies had drone combs with eggs in at least 70% of the cells at the beginning of treatment. In the first week of treatment, treated colonies reduced the number of drone eggs to about 10% of the cells in drone combs having them. After the treatment had been on the colonies for about a week, much of the formic acid had evaporated. At that time, additional eggs were laid in the drone comb. This second round of egg laying accounts for the delayed drone emergence observed during the experiment.

The formic acid treated colonies produced less than half the number of drones compared to controls and their drone production was delayed by several days (De Guzman et al. 1999). Adult drones that were produced had a much higher tendency to disappear from their colonies before sexual maturity. Not only were there strong differences in the production of drones, the survival of the drones also differed strongly. At the end of a one day emergence period, most of the drones that emerged in control colonies were alive (94%) as were the drones that emerged in those colonies treated with formic acid (97%). However, by day 10, a much lower proportion of drones survived in formic acid treated colonies (24%) when compared to the proportion of drones that survived in untreated colonies (49%). The weights of recently emerged drones in the two groups were not significantly different. Seminal vesicles and mucus glands of drones from colonies treated with formic acid and from the untreated control colonies were very similar Drones from colonies treated with formic acid averaged about 40% more spermatozoa than the average drone from control colonies.

The classical wisdom of using miticides in moderation or only when mite treatment thresholds are exceeded, must accompany the use of all chemical products, regardless of what the label claims about toxicity to bees. Also, the potential synergism of chemical miticides, as demonstrated with tau-fluvalinate and coumaphos, must be considered when using even the newer "softer and safer" chemical products available to beekeepers. Since beeswax combs are likely contaminated with the various miticides that have been used in the past, a regular comb replacement schedule needs to be developed. BC

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A Bee Lover's Garden

A calendar featuring bee-friendly plants is designed to raise awareness and funds for research, and can benefit local beekeeping organizations, too.

Kath M Petersen

"We're going to do a lot of good and make a big difference."

That's the goal of Mary Ellen "Mel" Hughes, who's dreamed up a way to help save the honey bees.

Hughes is not a scientist. Neither is she a beekeeper

Mel Hughes is a doer – or, shall we say, a "do-bee."

"I'm the kind of person that, when I hear about a problem, I think to myself, 'What can I do to help? How can I be part of the solution?' explains Hughes, of Asheville, North Carolina. "That's how *A Bee Lover's Garden* was born."

The problem Hughes heard about was, of course, Colony Collapse Disorder She immediately began researching ways she could help the honey bees. Becoming a backyard beekeeper was not a practical solution for her, but learning that she could grow bee-friendly flowers and plants was a perfect answer

"'I can do that,' I said to myself," remembers Hughes. "'Anybody can do that!'"

But when her search for bee-friendly plants led her to the U.S. Department of Agriculture's website, she found the list wasn't exactly user-friendly for a non-expert such as herself. The names were all in Latin, with no indication of which plants were annuals, perennials, trees or shrubs.

"And, of course, there were no illustrations," says Hughes. "Even if I didn't know the scientific names, maybe I could have at least recognized some of the more common plants."

That's when Hughes says she had her "eureka" moment: "I realized I could create a product with beautiful drawings and descriptions of these bee-beneficial plants. It could serve to educate about CCD and empower people to do something to help," says Hughes.

"So, not only could I help the bees in my own backyard, I could educate and inspire other people to do the same."

Successful entrepreneur Mel Hughes (standing) and award-winning artist Jay Pfeil team up to create 'A Bee Lover's Garden, a company aimed at supporting research for Colony Collapse Disorder. Pfeil's frameable drawings of bee-friendly plants such as the sunflower are featured in their first product, a calendar, available to local beekeeping associations as a fundraiser (photo by Matt Rose)

Hughes sought out renowned nature artist and illustrator Jay Pfeil from nearby Black Mountain, a member of the prestigious Southern Highlands Craft Guild. Unbeknownst to Pfeil, Hughes was one of a legion of fans from across the country who had long admired her work.

Pfeil immediately embraced the project.

"I was absolutely delighted," says Pfeil. "My work comes from a place of joy, and everything about this project felt good. Helping contribute to a healthy environment for bees means a healthier environment for people. I knew we could really make a difference."

The two decided a book would be expensive to produce and take too long. ("CCD is an urgent problem and needs addressing *now*," explains Hughes.) But a calendar was doable – it would be ambitious, but they could go from concept to a finished product within months. Featuring Pfeil's stunning, suitable-for-framing drawings, plus tips on bee-friendly approaches to gardening, the calendars would be "art for a cause," with a percentage of sales from *A Bee Lover's Garden* going to fund research on Colony Collapse Disorder

The buzz builds about 'A Bee Lover's Garden'

As Hughes and Pfeil realized the tremendous impact this project could make, both in increasing public awareness of CCD and in actually contributing to research that could save the bees, they shifted into high gear

A spirited entrepreneur whose background includes a number of successful gourmet food businesses, Hughes energetically sought support for the enterprise, both from financial investors and from experts in the beekeeping community

One of the first people she called on was Steve Forrest, president of Brushy Mountain Bee Farm, one of the largest manufacturers and suppliers of beekeeping equipment in the country

"Within minutes of presenting a prototype of our calendar to Steve, he stopped me and said, 'You've gotta talk to Kim,'" remembers Hughes. "He picked up the phone and told me to tell my story I had no idea I was talking to one of the foremost bee experts in the country, Kim Flottum! When I left Steve's office, he said, 'We're behind you 1,000 percent!' That was the confirmation we needed."

The endorsements continued.

"To be honest, we get a lot of people calling with ideas like this, but 90 percent don't materialize," says Dennis vanEngelsdorp, one of the country's best known researchers into the problem of CCD, recalling the first time he spoke with Mel Hughes about the project.

"You're always hopeful and encouraged that people have these ideas, but ideas are cheap and plentiful. Sitting down and doing the work, analyzing, fine-tuning – it's a rare person who takes it from concept to product. It's exciting to see that this one is going to come to fruition."

Colorful illustrations blossom into 'A Bee Lover's Garden'

As Hughes continued to work on funding and operations, Pfeil began to think about the plants to feature in the first edition of the calendar An outdoor enthusiast, Pfeil is inspired by daily hikes in the forested mountains where she lives. These excursions inform her award-winning style, which typically includes individual plant

How To Use 'A Bee Lover's Garden' in Beekeeping Association Fundraising

A Bee Lover's Garden annual calendar features drawings by acclaimed North Carolina artist, Jay Pfeil, renowned for her award-winning renderings of flowers, trees and other botanicals. Each month's stunning depiction of a bee-friendly plant easily grown in yards and gardens will be suitable for framing. Included will be tips on the cultivation and requirements of each plant.

The 2010 calendar is now available for wholesale purchase by beekeeping associations, at $10 each, just in time for selling at county fairs, fall festivals, and holiday events for the suggested retail price of $20. To learn more about how to use *A Bee Lover's Garden* as a fundraising project, contact Mary Ellen "Mel" Hughes at mhughes@abeeloversgarden.com. Want a sample to inspect first? Simply order a calendar online at abeeloversgarden.com at the regular price of $20.

species and nature scenes.

When she sees something that strikes her fancy "I just sit down and draw it," says Pfeil. "Later, if I want to know what it is, I'll look it up."

But for *A Bee Lover's Garden,* she approached it from the other way around, carefully choosing common plants that are easy to grow, such as sunflowers, holly, Queen Anne's lace, and even dandelions, and then seeking photos or live plants to use as models. She spent extensive time researching the variety of honey bees to ensure accuracy in her drawings.

With Pfeil's award-winning work in high demand – among the shops and galleries she supplies are the Nature Art Gallery at the North Carolina Museum of Natural Sciences in Raleigh and the River Gallery in Chattanooga, Tennessee – it was early spring before she finished the first drawing, a vibrant depiction of the purple coneflower

Hughes remembers how she felt when she saw it. "It was an exhilaration that I don't know if I've ever felt before. As any entrepreneur will attest, there is a high that comes from creating something out of nothing, an idea that hits you in the middle of the night.

"The very first time I heard about the mysterious disappearance of our honey bees, I realized this was a very urgent and potentially devastating agricultural and environmental problem, given that over a third of our food supply depends on pollination by bees," continues Hughes. "But with *A Bee Lover's Garden,* we're going to make a difference on so many levels. This sounds corny, but I feel so aligned with my life's purpose with this project."

More about 'A Bee Lover's Garden'

The flagship annual calendar for 2010 is only the beginning for *A Bee Lover's Garden.* In future editions, fruit trees, herbs, vegetables or others types of bee-friendly plants will be featured.

The company is also developing plans to create other products using acclaimed artist Jay Pfeil's bee plant art, such as note cards, journals, tote bags, t-shirts, mouse pads and other such items.

In addition to selling the products through local beekeeping and gardening associations, they'll be available in gift shops, garden shops, independent bookstores, destination gardens, and online. For more information, visit abeeloversgarden.com.

"What a great idea! I love it when someone sees a problem and jumps right in to do something about it! This Bee Lover's Garden calendar will educate people about the importance of healthy bee populations and show them what they can do to nurture bees in their own gardens. That would be enough right there, but with the lion's share of the net proceeds going to actually fund the research. no wonder we are all so excited! We are behind you 1,000 percent!"

– Steve Forrest, president of Brushy Mountain Bee Farm

A honey of a deal for local beekeeping associations

With the inaugural calendar hot off the press (printed on recycled paper, of course), Hughes and Pfeil are now taking their flagship product to yet another level: making *A Bee Lover's Garden* available to local beekeeping organizations as a tool for fundraising. Associations are eligible to purchase the high-quality calendars wholesale, at $10 each. Organizations can then sell the calendars at the regular price of $20, doubling their investment.

"Say, for example, a 30-member organization sells 10 calendars apiece – 300 calendars at the regular price of $20," explains Hughes. "The club would earn $3,000 to use as desired – to purchase equipment, fund scholarships for new beekeepers, whatever Everyone needs a calendar, and with Jay's beautiful work, benefiting a good cause, we believe the calendars will be easy to sell."

The impact that could be made is staggering, says Hughes, if beekeeping associations all across the country participate. "If 200 organizations sold 300 calendars each, that would meet our first-year goal of 60,000 calendars. That would enable us to donate upwards of $150,000 toward research – not to mention the tens of thousands of people who would be inspired by our calendar to grow bee-friendly plants."

As Pfeil develops ideas for illustrating the 2011 edition of the calendar, she sums up her thoughts about the project thus far "I think of *A Bee Lover's Garden* as being totally a 'yes' project, meaning everything about it feels good. It feels good that we're raising money for research. It feels good that we're helping local beekeepers, and hiring people in this economy It feels good that people are getting art in their lives for a very good price. And our customers can feel good, too, even about something as simple as leaving dandelions in their yards. They can feel good about truly making a difference. This project has already changed my life for the better in so many ways."

"We believe, without a doubt, that this is one of the most ambitious projects to date, nationwide, for raising money and awareness," says Hughes. "And when the mystery of CCD is solved, that will be a wonderful thing. There's no shortage of good causes; we'll just move on to the next one." BC

Kathi M. Petersen is a freelance writer and communications consultant in Asheville, North Carolina, where she enjoys eating local honey almost every day.

RESEARCH REVIEWED

The Latest In Honey Bee Research

Steve Sheppard

"Nosema species differ in suppression of honey bee immune response."

Most experienced beekeepers have some familiarity with the microsporidian pathogen *Nosema apis*, either through experience in their own apiaries or through reading any general discussion on honey bee pathogens. Known primarily as a problem in regions where winters restrict colony flight for extended periods, *N. apis* is one of those challenges that most beekeepers generally feel they can keep "under control." However there is now a new kid on the microsporidian block, *Nosema ceranae*. This pathogen can now be found in honey bee populations in Europe, the Americas and Australia and is therefore an object of intensive study in a number of laboratories and, simultaneously, an object of concern for many beekeepers. Some of the most pressing questions are related to the nature of the relationship between *N. ceranae* and colony health. In some countries there appears to be a clear association between infection with *N. ceranae* and colony losses, while in other assessments, infected colonies appear to persist without treatment or apparent ill effects for long periods. Perhaps the most noted reports of the deleterious effects of *N. ceranae* on honey bee colony health come from Spain, where the pathogen has been considered to be responsible for massive and widespread colony collapse.

Toward the goal of understanding possible mechanisms by which *N. ceranae* was more damaging to honey bees than *N. apis*, researchers recently compared measures of honey bee immune response and suppression by the two pathogens in Spanish honey bee populations (Antunes et al, 2009). Their findings give insight into both the specific issue of pathenogenicity and the broader issue of interactions of the pathogen with *Varroa destructor* and other stress factors.

In the Introduction to their work, the researchers use most of the section to explain details of the honey bee immune system. To recap these varied aspects would push this brief review article beyond its size limit, but importantly, they outlined a number of factors that could be measured to evaluate the honey bee immune response. These included three enzymes, three anti-microbial peptides and the protein vitellogenin. To set up the experiment, Antunez and colleagues fed healthy groups of recently emerged honey bee workers with a sugar syrup spore suspension containing either *N. apis* or *N. ceranae*. Control groups of bees were fed only sugar syrup. At four and seven days after infection, groups of workers were frozen for later analysis. Analysis consisted of evaluating the "transcript levels" for the genes encoding the aforementioned proteins involved in the immune response and for two other genes (used as standards). While the methodology sounds complicated, the "transcript level" refers to evaluation of the amount of "messenger RNA" (mRNA) that was produced for each gene at the time point of analysis. You can think of it as a measure of the level to which the gene was "turned on." The idea being that, if the immune response is "high," then there will be an increase in the number of copies of the messenger RNA produced from the gene, which in turn results in an increased production of the defensive protein. Got it? If not don't worry The results and conclusions are of primary interest as follows

Based on the mRNA levels, there were some very significant differences in the honey bee immune response to *N. apis* and *N. ceranae*. For the three antibacterial proteins (abaecine, defensin and hymenotaecin), the researchers found that bees infected with *N. apis* significantly increased expression of the appropriate mRNA, compared to control bees or bees infected with *N. ceranae*. Similarly, for one of the immunity-related enzymes, phenol oxidase (PO), the researchers found that *N. apis*-infected bees expressed increased mRNA levels compared to both the control and *N. ceranae*-infected bees. For vitellogenin and glucose dehydrogenase (Vg and GLD), *N. ceranae*-infected bees showed decreased Vg and GLD mRNA expression compared to *N. apis*-infected and control honey bees For another enzyme (lysozyme) there were no differences among the treatment and control groups.

Citing their work as the "first study to address the effects of infection by *N. apis* and *N. ceranae* on the immune response in honey bees," the authors pointed out that infection with *N. apis* rapidly activated the honey bee immune response, while *N. ceranae* infection actually "suppress(ed) the immune response by reducing the transcription of some of these genes." They noted that the suppression of vitellogenin (Vg) expression in *N. ceranae*-infected bees was consistent with reduced worker life spans (reduced longevity is known

"Queen breeders might be best served by refraining from using antibiotic *Nosema* treatments within their population of *breeder* colonies. Such action will ensure that highly *Nosema-susceptible* genotypes do not persist in their breeding stocks, while they search for the expression of and seek to increase the frequency of resistance traits in selected honey bee populations."

to be related to low Vg levels).

Antunez et al concluded that their research findings confirmed the detrimental nature of *N. ceranae* infection to *A. mellifera* and supported the observation that "*N. ceranae* is a more prevalent and virulent microsporidian than *N. apis*." They further noted that the reduced immune response of *N. ceranae*-infected bees could make them more susceptible to various honey bee viruses and, in instances of co-infection with *Varroa destructor* (also known to suppress honey bee immune response), the results "could be devastating for honey bee colonies."

This research team has presented strong evidence in various scientific papers documenting widespread *N. ceranae* damage to honey bees in Spain. As a final point of discussion in this most recent paper, the authors speculated on the possibility that genetic differences in the ability to deal with infections of *N. ceranae* exist among honey bee populations. If so and *N. ceranae* is found to be a less virulent pathogen in some bee populations in other countries, then it is a hopeful sign that selection and breeding of *Nosema*-resistant honey bees will likely be the most sustainable long-term approach. Likewise, it would follow that queen breeders might be best served by refraining from using antibiotic *Nosema* treatments within their population of breeder colonies. Such action will ensure that highly "*Nosema*-susceptible" genotypes do not persist in their breeding stocks, while they search for the expression of and seek to increase the frequency of resistance traits in selected honey bee populations. BC

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What's Going On With Those White House Bees?

Helicopter Prop Wash, The New Dog, Summer Heat, A Honey Flow - A Lot For The White House Bees To Deal With

Kim Flottum

It's been a bit since we checked in with the White House Bees and we wanted to see how they were holding up to helicopter prop wash, the new dog, Summer heat, a honey flow and their new-found fame.

So far they've behaved during a couple organic garden events, an Easter Egg extravaganza, a host of beekeeping and non-beekeeping visitors, and a visit from members of the First Family

The May honey flow in the D.C. area produced a small, early crop by early June when nearly two supers of a light, mild honey were removed. As soon as the honey was pulled it was moisture tested on a refractometer by Wayne Esaias, of NASA and hive scale fame. Wayne lives near Charlie and they attend some of the same bee meetings. It came in at 16.8% moisture a healthy number, especially in humid D.C. We understand Wayne and Jennifer Berry are putting together a story on Wayne's hive scale project for this Fall. Stay tuned.

The honey that was pulled was moved to a room in the White House basement that's used as a dining room for some of the employees. This is where Butlers, Ushers and others who work in Dining Service at the White House eat on a daily basis. It's air conditioned and there's lots of room to work so that's where it was extracted. It turns out this is a convenient location and since it was only 42 pounds it wasn't much of a chore and didn't make much of a mess. Charlie wasn't sure what it was, but it had a great flavor and color Honey flavors from even the same plant species can vary by location, season, and even beekeeper, so it's hard telling. There is some basswood still uncapped, as of late June, and that should be a treat.

Some of the Chefs in the kitchens were given a honey tasting experience at about this same time to demonstrate the wonderful differences in varietal honeys. The consensus it seems was that the White House bees' honey was as good as any of the two dozen tasted. Home field advantage, I guess. But the experience was worth the effort and served as a good learning project for everyone in the cooking section.

White House Beekeeper Charlie Brandts, and his niece Emily Paige during the annual Easter Egg Hunt

Foraging slowed considerably by the end of June and the remaining frames of uncapped honey are only slowly being finished. Charlie left a lot of these uncapped frames and he's watching them closely, to be harvested as soon as they are ready There should be about 80 or so pounds left to extract, once capped.

The four foot platform is still in place, meant to keep the bees and the new dog from coming in contact. To work the bees, now nearly nine feet high, Charlie uses a couple of saw horses with planks as a platform. One thing not anticipated with using a hivestand-platform this high is the unique view you get when you stand under the hive beneath the platform. Charlie has a screened bottom board and visitors can see a beehive from an angle not common to most of us. A National Geographic photographer used the perspective for a shoot when there in June.

Meanwhile, Charlie is raising some of his own queens again this year He's grafted into homemade wax cell cups and is learning as he goes. He took a queen rearing course from Rick Fell this spring, and is modifying some of what he's learned to fit his own operation. He's using a two-way and three-way for mating nucs, and moved them to a friend's beeyard who has a mix of locally raised Russians and Italians. After mating he'll bring them home and see how they do in his location. He's interested in locally raised and adapted stock, and doing it himself is one way to accomplish this. And, he's learning the ups and downs of the fine art of queen production in the process.

Charlie is going to get some stock from the Beltsville Bee Lab after talking with Jeff Pettis. He'll try them at home first to see how they do and perhaps try them at the White House down the road if they seem to work out. Again, Charlie's working a diverse genetic mix into the neighborhood, looking for the best traits of each and the best bee for what he needs.

All told, the bees at the White House are remarkably ordinary, not causing problems, and not being spectacular This is the way most bees are I suppose. BC

'Bout a 100 – Sideline Beekeeping

Allergies To Bee Venom

Larry Connor

What Do I Do When My Kid Is Allergic To Bee Stings?

Allergies to bee venom

As we reach the final 'Challenge' of sideline beekeeping, a task set out ten months ago, we reach the area of family allergies to bee venom. Statistically, there is a very high probability that a family member of a beekeeper will develop a serious allergy to bee stings. We need to examine how this happens and what we can do about it.

Indirect Exposure to Venom

When a beekeeper works a bee colony, he or she may wear a great deal of protective gear Who generally wears the most? I would guess that new beekeepers go into the hive with full protection – beesuit, gloves, veil and even duct tape to seal any weak spots. The other population of beekeepers are those who work with bees that are increasingly likely to sting – during honey removal, working bees with possible African influence (drones or invading queens), and with highly defensive stocks. That leaves a few beekeepers – many of them sideline or semi-professional in scale – who go into their bees with minimum protective gear

Yesterday (late June) I met with my class of first-year beekeepers at the family farm. The temperature was in the 90s and the heat index near 100. But a cold front was working through the area, and anticipating a defensive response from the bees, I asked all of the class members to suit up as we went into the bees. Since April many of them had developed confidence working without the suit and even the veil. While we did not get any rain as the front passed by, I noticed that because of the heat most of us were shedding our suits and even veils as soon as we could. The bees were bearded on some of the hives, but they were not defensive. The nectar flow was underway and the bees had filled most of the frames of foundation in supers added five days before. Nobody was stung with the suits on or off. I am always glad for that.

I warn the students that this may change as the colonies continue to grow and that later in the season, when the flow is over (about when you will read this) the bees may have more reason to defend their colony and its resources. I instruct them to always wear their veil to protect their eyes and head, but when they saw me without a veil they followed the instructor

Also by August I expect that some of the queens will have been replaced by supercedure or swarming (we found swarm cells in one colony built up from a nuc obtained just six weeks earlier) and the new queens may mate with drones from bloodlines that are more defensive than the Northern-bred stock we have in our colonies, a stock I deliberately selected for use in the class.

When beekeepers are stung, much of the venom is injected into the body But some of the protein-based material dries and remains on the skin. IF the beekeeper had been pulling honey, working African stock, or refuses to use a smoker, the likelihood of extensive stinging is high and both the beekeeper and her clothing will be covered with dried bee venom. Bees will sting bee suits, veils and gloves, and the stingers pump the venom into the fabric.

Because most beekeepers are often stung so much, they develop the antibodies that protect them against the venom proteins, and this works well to let them continue with their bees. But what about rest of the family and close friends?

If a beekeeper with a family returns home wearing the beesuit or general bee clothing (shirt and jeans), and if the beekeeper has had bee stings that day, it is quite possible that any family member who comes in contact with the beekeeper or even is close to the person will breathe in small amounts of dried bee venom. If the beekeeper is wearing a suit and the kids or grandkids run up for hugs and attention, they may get a pretty powerful dose of the venom – but not as much as a bee sting – and that is the problem.

Exposure to very low levels of protein venom on an erratic basis will stimulate the body to produce the 'bad' antibodies that lead to an allergic reaction to bee venom. Allergic reactions are widespread, and includes generalized itching (not just at the sting site), hives over the entire body, generalized swelling – especially of the neck and face regions, and perhaps most important – difficulty in breathing. In the case of a severe allergic reaction, the person may develop such a strong systemic response that they loose consciousness. ***With any severe reaction, seek medical help immediately.***

Anyone – including all beekeepers – can develop an allergic reaction to bee stings at any time. But the family member who has ingested dried bee venom protein by breathing it in will not be warned when accidentally stung by a bee.

Here is the warning for semi-professional, part-time, sideline beekeepers – this group of beekeepers often works alone until the work piles up. This may be when you make up nuclei, or pull and extract honey. Then you convince your teenager to help harvest honey, and the kid is stung while extracting and develops a reaction. If prior exposure to bee venom had lead to the production of the 'bad' antibodies, then there is a risk of an allergic reaction.

Bee Prepared

Certainly you should get an Epi-pen, which is a one-time dose of epinephrine. You need to see the doctor to get this and they are expensive. Keep a supply of antihistamines available such as benadryl in several places around your beekeeping operation. Keep ice around and use it on

the sting site to reduce the spread of the venom.

Have the talk with family about bee stings and bee venom reactions so you ALL are able to determine the difference between a normal and an allergic reaction. If you have a copy of Dr Dewey Caron's book *(Honey Bee Biology and Beekeeping)* around, read pages 167 171 to all the family (or they can read it themselves). Quiz each other on symptoms so you can sort out symptoms over the cell phone if necessary For example, if some one complains that they itch, find out if the itching is localized (a normal reaction), or is generalized (an allergic reaction).

Venom Management Plan

In my Ohio State days, Dr Walter Rothenbuhler taught the introductory beekeeping class with Victor Thompson. Rothenbuhler advised students to avoid getting stung, but once they were, get stung again so they develop the good antibodies that protect from further stings. Many instructors use the same approach.

In the family and friend model, I suggest you get the able bodied members of the family involved inside the beehive and with honey processing. Let them get stung and stung again. They will probably need to be stung on a regular basis. Attitudes have changed from my childhood, when stepping on a bee on a clover blossom in the lawn got a mixture of baking soda and sympathy Now days the same sting would involve a call to the doctor and with instructions to visit the ER and then see an allergist! With notable exceptions, we should all go back to the baking soda and sympathy routine, and learn to wear shoes when playing in the white sweet!

For the rest of the clan that cannot or will not help, adapt the **strip and shower** approach after working bees when you have received stings. In the garage or entryway of the house, remove all bee work clothing (your bee suit was taken off OUTSIDE), and take a cleansing shower to wash away the venom. Granted, this is not rocket science, but it will protect your little children and ornery teenagers and aged father from being exposed to the venom. DO NOT greet everyone with sweaty-venomy hugs and go to the shower Clean up your act first!

The final part of this plan is radical – wash your beesuit. I just got my latest *BC* and there is a photo of a beekeeper wearing a dirty beesuit. Get more than one suit if you can and wash them every two or three visits to the apiary and every time you have been through strong stinging events. Not only will you clean up the image of the beekeeping industry, but you will also reduce the amount of bee venom you are exposing to others as you go about your business.

If you do not wear a beesuit, but work in jeans (or work pants) and a t-shirt, use the same approach. In either case, you, as the beekeeper, must wash these items, since you should not expose your mother, or wife, or husband, to the dried bee venom. In this way you may avoid a later medical emergency

Allergy Treatments

The person who develops an allergic response to bee venom may want to visit an allergist and undergo desensitization therapy In most practices, the patient is given a tiny amount of pure venom and monitored for a reaction. The starter dosage is usually one one-thousandth of an average venom dosage. This will be built up over a

The business end.

time period determined by the doctor until the patient is able to take a full dosage of bee venom without allergic reaction.

Such treatment does not eliminate all risks, but reduces the chance of a reaction to a so-called normal level. This method is also used with beekeepers who develop an allergic reaction and want to continue keeping bees. I do not have any data on the number of people who undergo such therapy but I know it is pretty extensive within the beekeeping community

Therapy treatments usually involve careful screening to see which bee and wasp species' venom produces the allergic reaction. Each stinging insect species produces its own venoms, and they are specific.

Toxic Reactions

Any person not allergic to bee venom can have too many stings. This is due to the toxic nature of bee venom. The number of stings a human can tolerate varies according to weight, general health and age. It is my understanding the average adult man requires about 1,000 stings to lead to a fatality Some commercial beekeepers may receive 50 to 100 stings per day, but this is a tiny part of the overall population. I note with caution that most good beekeepers do nothing to promote stinging. They

The business.

One result.

use a smoker as they work even the smallest of hives. They wear a veil when doing extensive bee work. They are careful when they work a hive and go out of their way to shake bees off combs and lids so they do not crush bees and agitate the colony Some know when to call it a day as a weather front brings on strong electrical activity and increased defensiveness.

I have had dozens of stings at one time – always because of my stupidity and laziness to put on a suit or gloves – and I really did not like the pain or the discomfort. Some stings help the arthritis in my hands, and I accept that bonus to pain payback. The proteins in bee venom affect the body's systems, and too much can cause organ shutdown.

Some management operations seem focused on generating stings for the unprotected beekeeper so when the rest of the beekeepers in the crew reach for the duct tape to keep bees from crawling into the legs of the beesuit, ask to use it next. Because I take so many photos and the camera is black and attracts angry bees I have gone to using latex gloves for some sting protection and to keep the camera body and lenses cleaner Plus the latex seems to have repellency due to its strong odor I don't like it much either

Bottom Line

Learn to read your own bees. Keep yourself protected when the bees seem to be agitated. Watch for the triggers for stinging attacks: skunk predation, electrical storms, end of the nectar flow, and pesticide exposure. I have no data to show that there are more stings when hive beetles and/or *Varroa* mites are at high populations.

Put you veil on even if the instructor does not. Wear thin gloves if the thick ones inhibit your working with the bees. When you get your first sting get another in a few days, and continue getting stung on regular basis for the rest of your life. Take off your bee clothing away from the family, take a shower, and wash your bee stuff. Minimize dry venom exposure to your family and friends. BC

Dewey Caron's book, Honey Bee Biology and Beekeeping, is a hardcover textbook used in several bee courses around the USA and Canada. More and more bee clubs are using it for their beginner classes. It is sold by many bee supply companies and by the publisher at www.wicwas.com.

Log Chain Apiary

Scott Fisher

An Iowa Icon

On a warm April morning, Ann Garber prepares to make the rounds of her beehives in rural south central Iowa. It's been a long winter and the ground is finally hard enough to drive on. Just as she has done for the last 30 years, Ann puts on her beesuit and prepares for a day of inspecting, equalizing and reversing her hives scattered around rural Wayne County. As owner, operator and head beekeeper of Allerton's Log Chain Apiary, Ann is anxious to see how her bees have survived Iowa's Winter She's in for a long day, as is her helper Jane Cooley, a local bee enthusiast and frequent assistant to Ann's hive work. Also along for the day is Ann's very novice next-door neighbor who knows only that bees sting and Log Chain honey is the best he has ever tasted.

Asked if this outing establishes the start of the honey season, Ann replies, "The bee year really starts in the fall when you're getting your bees ready for Winter You want a good healthy queen, a good cluster of bees and quite a bit of honey left in the hive." Ann explains that the bees sit quiet in the hives all Winter long until January in the Midwest, when the maple trees start blooming and the honey production picks up. In warmer climates, Spring comes sooner and the bees don't really have much of a quiet stage.

Front of Log Chain Allerton, IA warehouse.

Ann Garber prepares for workday at hives.

Our first stop is a few miles northeast in Corydon where Ann and her husband Keith, a local physician, have their home, including some hives. While Jane works the smoker Ann explains the procedure of opening up and cleaning the hives then inspecting each for signs of activity Ann demonstrates how she rearranges frames to equalize the brood populations, then reverses the hives and adds syrup to help the bees get going. She checks closely to make sure the queens are laying eggs.

"Oh, this one looks good," Ann says, there's lots of activity as if these bees sense there's a "newbee" among the veteran keepers and want to impress him by showing off their buzzing and flying skills. "Just don't swat at them," Ann advises. She and Jane move methodically down the row of hives, closely inspecting each one for activity and signs of problems. The first three hives look fine. The fourth one, not so much.

"This one looks pretty dead," Ann says, pointing to

the now empty hive. "We'll just let this one go for now," she decides moving on to the next hive. After reversing the hives, Jane fills the feeders with corn syrup that we've brought along in five gallon buckets on the back of Ann's old Ford truck. Jane points out the yellow pollen on some of the worker bees. "I wonder where they've picked up that color pollen already?" My bees at home are in the apricot trees that are out early this year " One is reminded that creating honey is only one of the important functions that bees perform.

Ann and Jane work quickly and efficiently replacing damaged parts of the hives with spare pieces brought along on the truck. They're a good team and enjoy their work. Today the hives aren't quite as heavy as they look, but as Jane predicts, "Just wait until they're full of honey " "Twelve pounds per gallon," Ann adds. For now, the hives contain only the newly awakened bees who will get much busier as the weather gets warmer and Spring blooms open. From the hives in Ann's yard, we travel west, then south, in a big circle around the county stopping at site after site where Log Chain hives blend in to the rolling southern Iowa landscape.

This area wasn't always so peaceful, especially regarding honey-related issues. In fact, not far from here armed Iowans and Missourians faced off against one another in the infamous "Honey War," each side laying claim to the valuable "bee trees" that populated the area 200 years ago. It took the United States Supreme Court to settle that dispute.

But there is nothing but warm sun and blue sky on this day as we continue our patrol and inspection. By mid-afternoon, Ann is encouraged that the Winter losses, while significant, are not much more than she expected, compared to previous years.

Back in the Log Chain Apiary shop on Allerton's main street, Ann explains how she got started in the honey business. "It all started in college [at the University of Iowa] taking a zoology class," she recalls. "I learned about the food chain and how it was in so much danger DDT had come out and they were bringing in bees from far away It was all new to me and interesting." She also learned about honey's healing benefits, especially related to allergies, as well as for multiple sclerosis and arthritis patients.

After college, she and husband Keith settled in south central Iowa where young doctors were needed. With both of them working at the local hospital and raising four kids, there wasn't much time for anything else. But bees seemed to follow Ann wherever she went. She had a small observation hive in the window of their Corydon home which entertained Ann and the family "It takes a while to learn it all, but you get fascinated by it," she says. She started saving her hospital wages for the future when she might be able to pursue her interest in bees and beekeeping.

Eventually, they purchased some land just south of Allerton, mainly just to provide getaways to a scenic place. "It was a neglected farm and a small creek ran down through the middle of it. I just thought it was an aesthetic place. The kids were little and we'd go down and work, pick up rocks out in the field, just to get out of town. We put in a garden out there." On the property was the site of Log Chain Country School, so-named, according to legend, because a horse thief had once been hanged

One of several southern Iowa locations of Log Chain Apiary hives.

from a big tree in the school yard by locals who used a log chain rather than a rope to dispense justice.

"When we bought the land, there was an old house on the property The walls were full of bees that we ran into whenever we mowed the grass out there. Those bees thought they owned the property, but I had to show them otherwise," Ann recalls. As time went by, Ann's interest in her home observation hive and trips to their farm inspired her to consider the possibility of doing more.

"I signed up for a bee class taught by the Iowa state apiarist, Glen Stanley over in Ottumwa. He was very helpful. I would encourage anyone just starting out today to take a bee class. It also helps to work with a mentor because there are lot of things you can learn by doing that you can't from just reading it out of a book. I would go and help the state apiarist when he'd do splits of his colonies, so that was my mentoring. The rest of the time I learned on my own. After I took the class I ordered three packages, got my equipment together and set it all up down there on the farm. We had a garden down there by then. We processed the honey in our garage. You know," Ann says with a smile, "there were people in the family who mistakenly thought the garage was for cars."

Ann's honey operation eventually grew too big for the family garage. "At first I didn't sell the honey – I just gave it away. Then I thought maybe I could make a little money at this. So, I started looking around for alternate sites and this building in downtown Allerton was available. It wasn't a shop at that point. I just used it for extraction." That was in 1993 and her bee operation had grown to 200 hives.

Ann Garbert keepers careful records of her hives.

Interior of Log Chain Apiary shop – extracting equipment.

It wasn't long before Ann's Log Chain Apiary was producing enough honey to sell all over Iowa and northern Missouri, ranging from grocery store chains such as HyVee and Dahl's to smaller mom and pop stores and state welcome centers, as well as food co-ops and farmers' markets in Des Moines. Ann's honey products are unique in the Midwest market. "Not many people are doing comb honey It's more labor intensive. I go up to farmers' markets Des Moines and there are six or eight beekeepers up there and I'm the only one selling comb honey which draws people to my booth. You can produce a bigger crop and probably get more for your money with strained honey than with comb honey, but you can make 12 times as much from a pound of comb honey as a pound of strained honey " She also sells her products from the logchain.com website.

Log Chain's unique flavored cremed honey is very popular, some of which has won awards at the Iowa State Fair There are over a dozen flavors, from apple to walnut. Her Allerton shop is half process/production operation – half retail store. Hundreds of school kids and bus tour visitors have watched Ann's honey production demonstrations. Cross-country tourists following the original Mormon Trail, as well as guests from all over the world staying at her neighbor's bed and breakfast, enjoy browsing through the shop that displays all the Log Chain products from individual honey jars to gift baskets to recipes. Ann's shop assistant Jackie Ambelang is especially talented in creating beeswax candles and blocks. The beeswax has dozens of uses. One local business even purchases Ann's beeswax to lubricate its machinery.

Interior of Log Chain Apiary shop – product displays.

With success has also come big challenges. Due to Iowa's unpredictably harsh Winters, Spring is always a tense time of year determining how many hives have survived and whether diseases are going to be an issue. Ann recalls, "That Winter of 2000-2001 was brutal. Beekeepers lost 85 percent of their bees. It was sad to go out and find all those dead bees. You try to provide a healthy habitat for them, but there are going to be losses."

Some of the treatments for disease used years ago, aren't as effective today To check for *Varroa* mite infestation, Ann uses the sugar shaker technique. As she shakes the jar, mites that have attached themselves to the bees fall off the bees, and then are removed through the mesh of hardware cloth, allowing Ann to determine the level of infestation. To check for tracheal mites, she cuts open sample bees and looks at them through her husband's microscope. While she hasn't had much of problem with tracheal mites lately she has used grease patties to stop any tracheal mites.

Weather and diseases are challenging enough. Like every other small business, Ann has had to deal with rising energy costs, as well as new restrictions related to anyone in the agricultural and food businesses. She recently replaced all the galvanized pipes in her extraction systems with stainless steel. No small expense, but much more effective in avoiding the residue that results when the acid in honey breaks down the lining of the galvanized pipes. All of this cuts down on the profit gained from all the hard work.

And hard work it is. "Bees are heavy," Ann admits. "I can't lift a hive full of honey anymore. I have about 35 hives now, down from about 50 just a few years ago. I try to extract right away I prefer to take it off in the morning and extract it that afternoon because otherwise it gets cold and then doesn't spin out so well. Plus it's cooler in the morning. We put it in barrels and store it down the street in the warehouse. The honey that sells best is the early season honey – it's lighter in color "

Ann's children are grown up and moved away with families of their own pursuing their own lives. With her husband Keith's recent retirement from the hospital, Ann is seriously considering selling Log Chain Apiary to someone who will continue what she has built up over the last thirty years. Perhaps someone who would like to expand the business with more use of the Internet or providing bees for pollination rather than just producing honey "Some beekeepers make a lot of money sending their bees to California orchards where they pay for the pollination," Ann explains.

Ann would like to see more young people develop an interest in beekeeping and honey producing. She encourages involvement with national groups such as the National Honey Board and state associations like the Iowa Honey Producers Association. In Iowa, the Iowa Department of Agriculture and Land Stewardship (IDALS) is the umbrella organization for honey producing services. After a long absence there is now, once again, a state apiarist (currently Andrew Joseph) who works out of the

HONEY WAR

In the first decade of the 1800s, the Osage Indians gave up their land to the United States and a government survey was ordered to establish the territorial "Indian Boundary Line" near today's Iowa and Missouri borders along the Mississippi River. A surveyor named J. C. Sullivan carefully marked the boundaries of the newly acquired U S. territory, using the mouth of the Des Moines River as a starting point. When Missouri became a state in 1820, language in the border description was confusing regarding the Des Moines River and the Des Moines Rapids in the Mississippi River (sites about 10 miles apart) but also naming the "Sullivan Line" as its official eastern boundary. The Black Hawk War and Indian Removal Act in the 1830s opened Missouri and Iowa Territory to even more settlers, but as the years passed, Sullivan's original markings became obscured.

Settlers moving into the area were delighted to discover hundreds of "bee trees" – hollow trees full of valuable honey and bees. But as the area became more populated it wasn't clear exactly who lived in Missouri and who lived in Iowa. So in 1837, Missouri commissioned a new survey, this one done by a man named Brown who established Missouri's border several miles (9.5 to be exact) north of the original Sullivan survey line. The bee trees, it seemed, belong to Missouri. Naturally, this did not sit well with those who had considered themselves living in Iowa Territory.

Back then honey was as "good as gold" and not only were settlers anxious to harvest that honey, but the state of Missouri recognized a source of new revenue in the form of taxes on it and the land on which the trees were located. Iowa territorial settlers stubbornly refused to recognize the new boundary line. Tempers came to a boiling point when Missouri tax collectors were not only refused payment, but, in some cases, thrown into Iowa's territorial jail. Missourians who chopped down the hollow bee trees were pursued by angry Iowans, charging trespassing and theft, threatening bloodshed. Bands of men organized on each side, including both militias.

Before the "Honey War" got completely out of hand, cooler heads in the legal system took over to try to sort it out. Eventually it was settled once and for all by the U. S. Supreme Court which, in 1849, ruled in favor of Iowa (by now a state), establishing the old Sullivan Line, south of Brown's survey, as the true border between the two states. While the "Honey War" was officially over, it didn't stop disputes between the two states from continuing for decades. The Civil War (or War Between the States, if you wish) only created more friction. Property right disputes continued, though not related to honey or bees. In 2005, Missouri contracted for another major survey – one that ironically discovered the markers put in place by the U. S. Supreme Court's 1850 survey, putting the issue to rest once and for all (we hope).

state Bureau of Entomology and Plant Science. "They still teach the bee classes and publish a helpful newsletter," Ann says. They also coordinate the registration of apiaries, necessary if a beekeeper plans to move hives out of state. A beekeeper can also register hive locations in the state's Sensitive Crops Directory so that chemical applicators, such as aerial sprayers, will avoid the area with potentially harmful chemicals. There is a lot of support and mentoring opportunities for new beekeepers.

But today Ann is too busy to think about retirement or profit and balance sheets. The honey season has just begun and with it, Iowa's prettiest time of year, and her busiest. Even after years of hard work, in good times and bad, Ann's joy of beekeeping is still evident while visiting with her in the Log Chain Honey shop on Allerton, Iowa's main street. "It's a fascinating process," Ann says. "A bee colony is a unit – with all these industrious creatures working for a common goal."

Log Chain's website is: www.logchain.com. BC

Scott Fisher is a free lance writer living right next door to Ann Garber in Allerton, Iowa.

All The Buzzz in...

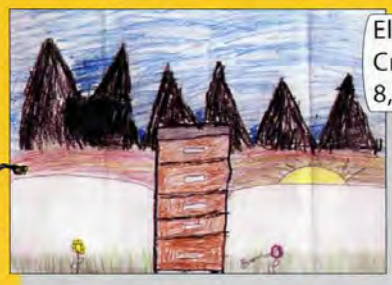
Hello Friends,

The end of summer is near. Enjoy every minute.

Your friend,

Bee B. Queen

Happy Summer!



Elayna Creech, 8, TN

Hannah Hayes, 9, MI

Sofia Dyroff, 3, NY

Honey Bees are Not Alone

Honey bees are amazing pollinators but they are not alone. There are other bees that pollinate plants too. There are about 4,000 species of wild bees in the United States. They are very important in pollinating wild flowers as well as our food crops. Let's take a look at some of these bees.

Bumblebee

The bumblebee often makes it's home in the ground. Their colonies are much smaller than their relative the honey bee. Only the queen survives the winter. They are sometimes used to pollinate tomatoes inside greenhouses.

Mason Bee

Mason bees are solitary bees that pollinate many fruit crops including almond, apple, cherry, pear, and plum. They are slightly smaller than the honey bee and live in holes made in wood by things like woodpeckers and other insects. The bee makes a small ball of pollen in the back of the hole and lays an egg. She then makes a mud divider and starts again with the pollen and egg. She does this over and over until she seals the hole with mud. There are about 5 – 10 eggs laid in one hole.

Leaf Cutter Bee

Leaf Cutter Bees carry pollen on their hairy abdomens. There are more than 140 species found in North America. These solitary bees make their homes in soft rotted wood or hollow plant stems. They cut pieces of leaves to line their nests.

Photos thanks to Dave Green at Pollinator@sc.rr.com

Celebration Pollination

Bees aren't the only things that pollinate. Unscramble the letters to discover other creatures that pollinate crops. As you can see, bees (honey bees and other kinds of bees) do most of the pollinating. The numbers show the percentage of crop pollination provided.

72.7% BEES
18.8% EISFL _____
6.5% TSAB _____
5.2% WSSAP _____
5.1% TEELSBE _____
4.1% DRISB _____
4.4% TTERUBEISFL _____
and MTHOS _____
1.3% PSITHR _____

Help our Pollinators

We are losing all kinds of pollinators. This is a problem for wild flowering plants that often need a pollinator to make seeds. If they can't make seeds, there can't be another plant. Some things you can do to help.

Be a beekeeper.

Do not use pesticides.

- Encourage all your neighbors and friends to avoid using pesticides.

Make a mason bee house.

Leave dead wood on the ground.

Grow plants that provide nectar and pollen.

Learn more about pollinators.

... Bee kid's corner

Produced by Kim Lehman -www.beeladyprograms.com
www.beeculture.com
August 2009

Eden Creech, 3, TN

William Fallini-Hass, 6, CA

John Creech, 5, TN

Marie Mejia, 9, CA

Here are a few ways to make your own Mason bee house. Better yet, have a party and invite your friends to come and make their own houses. Attach firmly to the side of a shed, fence, or house so it will not sway. They prefer a sheltered spot out of the wind facing east or south.

Build It and They Will Come

Wood House

You will need:
Drill
- Drill bits (5/16th works best)
- Square piece of scrap wood about 4x6 inches (not treated lumber)

Directions:
1 Drill holes into the block of wood about 5 inches deep. Do not go through the wood.
2. Screw a hook in the top.

Some wasps and leaf-cutter bees will also use this house. Take a look at the hole plugs to tell who is using the house. The plug of the mason bee is always rough while the wasps prefer a smooth surface. Guess what the leaf cutters uses? Why chewed up leaves of course.

Straw House

You will need:
- Drinking straws (The best- sized hole is ¼ inch by 3/8 inch in diameter. Paper is better.
Any recycled container· paper milk carton or can

Directions:
1 Cut the straws to about 6 inches in length.
2. Pack the straws into your container.
3. Attach a picture hanger on the back or attach the container first by screwing the bottom to the side of a wall, then fill with straws.

All Natural House

Instead of using drinking straws use pithy-stemmed plants like sumac or goldenrod. You can also use bamboo or drill holes in dead trees or fallen limbs.

Cora Hilling and Shawn Strahin from West Virginia are having a magical moment with our flying friends.

Beecome a Bee Buddy

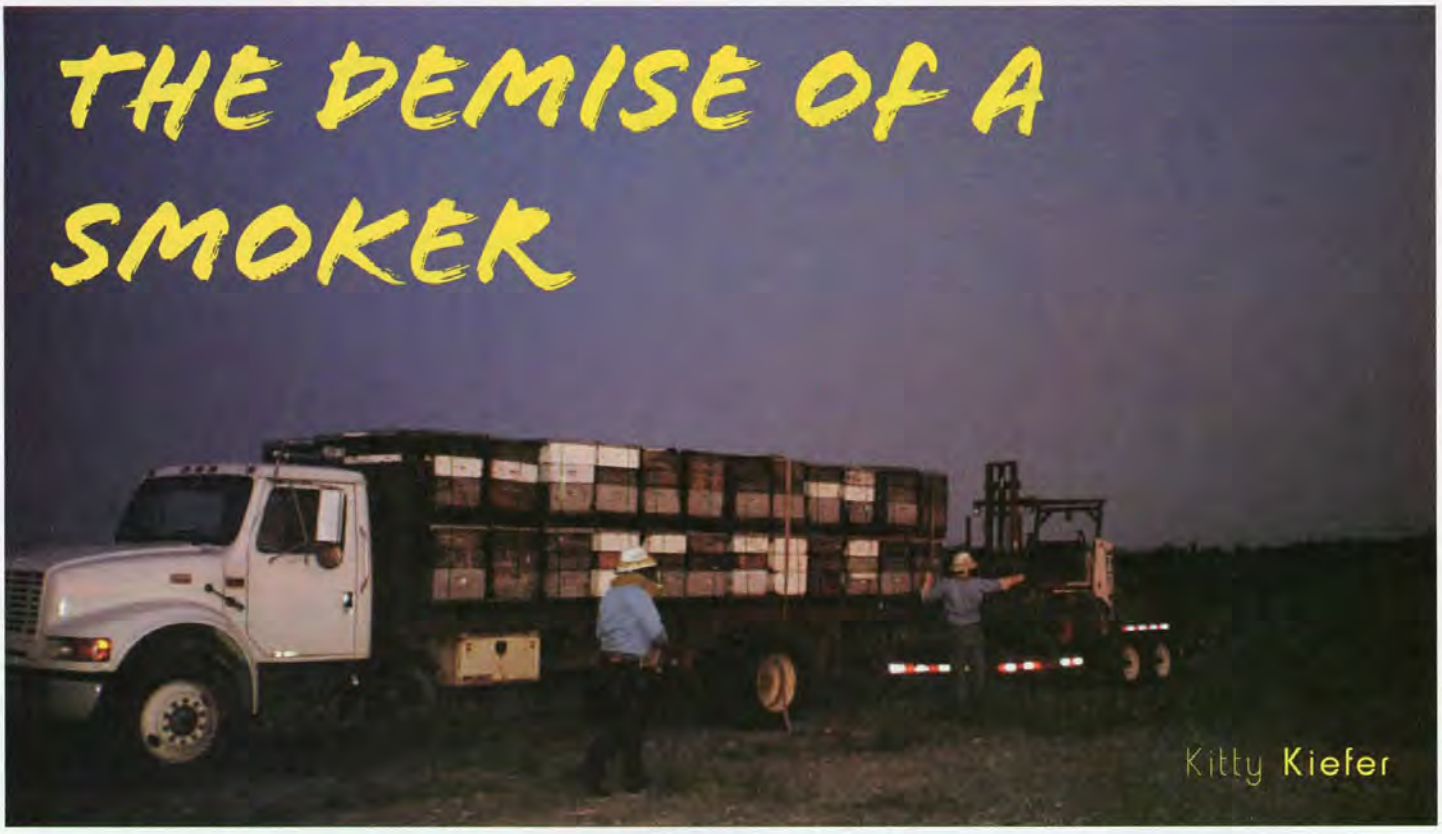
Send two self addressed stamped envelopes and the following information to: Bee Buddies, PO Box 2743, Austin, TX 78768. We will send you a membership card, a prize and a birthday surprise!

Name: _____
Address: _____
City, State, Zip Code _____
Age: _____ Birthday: _____
E-mail (optional) _____

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

Answers: flies, bats, wasps, beetles, birds, butterflies and moths, thrips

THE DEMISE OF A SMOKER



It was a dark and rainy night when I mashed the lit smoker under the ramp of the Bobcat trailer in Linlithgo, NY Why was I there and what was I doing? May 1st is the day that apple pollination often begins in the Hudson Valley of New York state. Every year when I am there, I check to see if any more orchards have lost their person who cared for them. You can tell if the trees haven't been pruned for a year and that usually means the farm is going in the wrong direction. Once farmland is lost to development, it's gone forever Bees and beekeeping are all wrapped up with orchards and farming in general. I hate to think of it as a shrinking market.

For about five years I've ridden around with Merrimack Valley Apiaries, helping with apple spread-out. In the course of helping a huge commercial pollinator, I have become a hobby beekeeper This is why

The tractor trailer loads of bees usually arrive around dusk on clear days and in the afternoon on rainy dark days. In bad weather the bees are quiet, just as they are in the dark. My job is to pull the screens off the load – front and back, smoke the bees and either just get the screens out of the way, or fold them to be ready to go onto the next load. Folding the screens right is really important because when you are spreading the screens out on a full load of bees just after they've been put on the tractor trailer, the beekeeper has one chance to kick the screens out over the load. It is dark up there, the footing is bad – you are walking on the tops of the hives, and the bees do not welcome you. The screens have to unroll and drape just right. You get one chance.

Anyway, the person running the Bobcat signs off the Bill of Lading, if there is one and begins to unload the bees from the trailer The pallets, six colonies per, are stacked up on the truck and I run to smoke them, to keep the bees in and not roaring at us. You want to be able to unload them in the dusk to darkness, but not to have to turn the bobcat mast lights on as the lights will stimulate the bees even more. The bees are best in their boxes, because the colonies will be moved immediately and placed for apples.

I have a brother who has four kids – I have one. One was all I got and she's great, but once I asked Tom what it was like having four – he said it is zone defense – you do not cover the individual, just the zone. That's what it's like with lots of colonies. It is very much us against them, and we are two and they are many, even though the weather is cool and bad. Four hundred and32 colonies stacked up on the trailer is a lot of bees. They can be pretty ticked off, and they can really get "it" going on without smoke. So if the smoker didn't function, the bees would have the upper hand.

And it can be really tough finding fuel out there where ever you are. I've burned a lot of hay – either taken from tumble down barns – sometimes musty and moldy, taken from roadside berms, sometimes dry because I planned ahead and collected it when I didn't yet need it. I really prefer pine straw, a

much nicer smell and burn characteristic. I'm afraid of baling twine because of the rat poison built in. Anyway, it's my job to keep the supply of dry fuel in an old feed sack which is then kept in the tool box under the bed of the straight truck. It will stay dry in there. When the smoker is going well – has a bed of heat in the bottom, packed in just right, you can keep it going all night, and can even burn fairly damp fuel. I keep the fuel in the tool box, with the straps and buckles and other spare tools. Sometimes there may even be a spare hive tool in there.

When you are unloading bees and then doing spread out in the same night, you make two lines of two high pallets of colonies on each side of the tractor trailer When the trailer is empty, the driver goes on to his next load, or on to a shower somewhere or off to park and sleep. The beekeeper is left with his straight truck with Bobcat trailer attached, Bobcat, one smoker and, with luck, one pair of gloves. There is an alley wider than the road tractor that just left, and the bees are often bearded up on their boxes. You smoke bees, you load bees in the dark, on to the back of the straight truck – 24 pallets, two high, strap them down, more smoke, load the Bobcat onto the trailer, raise the ramps, put the smoker in its spot – sometimes in a pocket on the headboard, sometimes on the trailer – it's very hot at this stage and smoldering.

Then we go to the first drop. This may be in the same orchard. But often we start with the drop that is farthest away, as then the spread-out goes faster at the end when we are more tired. There are 72 pallets on a tractor trailer, so 72 divided by 24 is three straight truck loads for placement. Sometimes one pallet goes in a spot, sometimes five or six, depends on the grower Some growers just do not believe that bees fly for two miles, so they want one pallet here, and another there, and there and there. You creak and rattle down these little access roads, with apple branches brushing and pushing the bees and bending the truck's mirrors back. You are often driving with your veil on, sometimes even dragging the ramps. The soil in apples is often full of clay and therefore very slick when it rains. So you must strap down every load, and should chain the Bobcat. Loosing pallets off the load in the dark makes the night really long.

All night you stop and go, mess with straps, trailer ramps, uneven ground, adding fuel to the smoker – running and stumbling in the dark. The smoker never goes out in the course of the evening. I get the gloves, not for the bees so much but for the smoker which is really hot. The hinges are always broken on our smokers, because the creosote from the hay glues them shut and you have to grab all the hot parts to pull the top off – often laying the thing down and prying with the hive tool. Meanwhile the Bobcat driver will be yelling, "Smoke!!" as his hands are on the controls and cannot leave them and I have the only gloves. The bees figure this out pretty quickly On a hot night I smoke the driver almost as much as I smoke the bees.

So you see, there is lots going on out there during spread-out. A good place to put the smoker down to pry it open for more fuel is on the steel bed of the straight truck or on the bed of the trailer if the truck still has too many bees. It's easy to put the smoker down in the wrong place, like when you have to open the tool box to get the dry fuel out to feed the smoker Then if the Bobcat is on uneven ground I get yelled for to hold on to the pallets as we go into the apple trees – to keep the colonies from dumping off. Bobcats have no suspension, so they can almost catapult a load off the forks with the right configuration of ruts and hillside under their wheels.

So this time, when the smoker got wrecked, it was a combination of my trying to get more fuel into it while I was working on the back of the trailer trying to get the lid off and the Bobcat driver needing me to hold on to and balance two pallets of bees as he was driving up a slippery canted hillside for specific pallet placement. I just dropped the smoker and ran to balance the bees. It fell under one of the ramps, and when the Bobcat drove up on to the trailer, the smoker got squished.

A few years ago I had a little pad of sticky notes that said on the top, "I didn't say it was your fault, I said I was going to blame you." I got blamed for this smoker problem – with dramatic sighs and sideways glances. I'm a hopeful and persistent soul. We had one more load of 24 pallets back where the road tractor had been unloaded. I picked up the now oval smoker and

"So this time, when the smoker got wrecked, it was a combination of my trying to get more fuel into it while I was working on the back of the trailer trying to get the lid off and the Bobcat driver needing me to hold on to and balance two pallets of bees as he was driving up a slippery canted hillside for specific pallet placement I just dropped the smoker and ran to balance the bees. It fell under one of the ramps, and when the Bobcat drove up on to the trailer, the smoker got squished."

pried the top off. At least now I could dump the embers and not loose the screen in the bottom so it would cool enough for me to try to restore its shape and function. Waiting for it to cool, I climbed into the straight truck and looked under the seats, under the debris of old fast food meals in paper bags, some filthy tee shirts, busted buckles, staple guns and empty staple boxes, the usual debris, hoping for another smoker There often is another smoker somewhere. While riding back to base, I tried pressing the thing back into a better shape, but just couldn't get the

bellows to work.

The last 24 pallets would have to be OK, sans smoke. It was drizzling, no wind, and dark. However I had to give up my gloves to the driver It was only fair I took my rings off and put them in the pocket of my jeans and gritted my teeth. Stings hurt no matter what we say or how tough we are. We loaded and tied off and began the last drops, grateful that we had left the closest for last.

So how does this get me into hobby beekeeping? First, I am no longer afraid of bees. They are just insects. There are ways to establish who is the alpha with them. Second, if you are methodical, smooth and repetitive with them and you listen to a person who knows more than you do, you learn how they live and what they need. Third, when you use the right amount of smoke, they are settled and stay in the colony so long as they are queen-right. Fourth, most importantly when working with thousands of colonies you learn to think methodically and quickly on your feet. This is what beekeepers do day in and day out – deal with the moment, keep the ball in the air and do what preserves and strengthens their colonies.

Now when I suit up for my own 12 or so hives I can take it as it comes. I can recognize queenlessness, I can read my brood patterns, I look for signs of disease and parasites, and I can sneak the odd bites of honey from my hive tool up under my veil. I move slowly and evenly It's all interesting. And I get to go out with the pros, every now and then. BC

Kitty Kiefer works with Merrimack Valley Apiaries moving bees, smashing smokers and selling honey.

MENTORS

Kirk Webster reminisces about more of the people that have influenced his thinking, and his apiary. Part II.

Another of my favorite mentors I never met in person, and knew him only from his books and a little correspondence – Brother Adam. During the three Summers I spent at the Cabot Farm, I spent an embarrassing amount of time alternately lying on the floor reading *Beekeeping At Buckfast Abbey*, (Brother Adam), and *Contemporary Queen Rearing*, (Harry Laidlaw); and then rushing out to try yet another method of cell-building or set-up for nucleus colonies. I was attracted right away to the clarity of Br Adam's writing and the exotic setting, but at first I considered his books somewhat quaint and removed from the everyday working reality of beekeeping. But as I gained more experience and continued to study his books, I gradually became convinced that this was by far the most impressive and accomplished beekeeper I had ever met or heard of. From the scope of his breeding work, to the meticulous attention to every detail as he solved a whole series of practical problems, he created a standard for beekeeping that has never been equaled. I have yet to find anything in his books that doesn't hold up in actual practice. My own system of queen rearing, overwintering nucleus colonies and bee breeding was lifted in its entirety from Brother Adam's books – adapted only slightly for our Langstroth-size equipment and to produce more products for sale.

I had some correspondence with Brother Adam near the end of his life. His replies to my questions always came back immediately and were typed on the same, obviously ancient, typewriter I once asked him how much inbreeding a certain line could stand before it became damaged by inbreeding depression. His seemingly vague answer surprised me: "Well, it depends it's hard to say but, I happen to have a copy of this season's breeding plan, which I enclose for you." Finally, after learning his system of record keeping, and carefully studying the few lines of letters and numbers he sent me, I realized that he had answered my question in the most thorough and elegant possible manner – by showing how his annual breeding program used every acceptable degree of inbreeding on a sliding scale, so that the point of unacceptable damage could be known exactly I'm told that he often challenged his students and protégés in this way, making you work and stretch to find an answer so that you never forgot it. Every little detail of his beekeeping system had a purpose, and the elegance imbedded in a seemingly complex undertaking was truly breathtaking. One of my prized possessions is a note from him inviting me to visit the Abbey and its bee yards; and one of my biggest regrets is not being able to make the trip while he was still alive.

The mentor I got to know in person during my time in Wenham was Nevin Weaver; brother of Binford and Roy Jr., of the famous beekeeping Weaver family from Navasota, Texas. Nevin started off in the family bee business, but then decided to continue in school and work eventually as a scientist. He was the first person to raise a worker bee, from egg to adult, in a petrie dish – sleeping on a cot in the lab, so the larvae could be fed every few hours. He was teaching Physiology at U Mass, Boston, when I met him one night at a county bee club meeting. He didn't make his living from beekeeping, but he stayed close to his family and Weaver Apiaries, and he and his wife Betsy spent the Summers in Navasota. He did many research projects, without getting heavily involved in the funding rat-race, simply by using the family's bees and facilities during his Summer vacations. Nevin was an enormous help to me in the early years when I was learning the basics of cell-building and managing mating nucs. With any kind of a beekeeping question, I always went to Nevin first. He and Betsy were also completely supportive of the idea of becoming a full-time beekeeper – I think they had more confidence in me than I had myself. Everyone needs a couple of mentors like that. It was a great privilege to be friends with them, and I spent several memorable Sunday afternoons at their home in Lexington, MA. On one of these occasions Nevin gave me the old excluder box that I still use every year for setting up cell builders. After I moved to Vermont, they came to visit once in the Winter, but they never got to see the full-blown, summertime apiary they had done so much to help create. Nevin was literally walking to the car to start on a July trip up here, when his legs collapsed in the first episode of the degenerative nerve disease that finally carried him off. I'll always be grateful to Nevin and Betsy for their example of generosity, genuineness, warm-hearted support, cheerful optimism and self-confidence.

I'm going to skip quickly over two important insect mentors: tracheal and *Varroa* mites. I've written

Brother Adam

quite a bit about how tracheal mites helped me to develop my system of bee breeding, and showed how pests and diseases can *improve* our honey bees, if we can see them as friends and allies. When *Varroa* came, I was better prepared, and now it appears that these mites can also serve the same purpose – even with the huge imbalance between this pest and its host. But the key concepts that enabled me to make these connections came to me many years earlier from my favorite friends and mentors: Bill and Martha Treichler of Hammondsport, NY

We can go back now to The Mountain School, where I first met them. For a kid from the suburbs who didn't know much – except that he didn't like suburbs – The Mountain School and Vershire, VT were a kind of paradise. The people were mostly interesting oddballs with lots of energy and ideas. When you walked out the door in any direction, you first encountered the school farm, then abandoned farmland; then long-abandoned, steep farmland, completely reclaimed by forest 100 years ago. Everything was new, mysterious and interesting. The huge and overwhelming presence of Nature loomed everywhere, and evoked in me a new sense of having a home. The faculty and students were impossible for me to pigeonhole based on my previous experience. Everyone seemed to be from a different place and situation. We were a rag-tag and successful academic community, but almost everyone also spent time helping with the farm and/or exploring the countryside, on foot and on skis. The girls were the fiercest hikers of all and a few of them thought nothing of "walking" 15 miles between the end of lunch and the bell for dinner I was in awe of them and struggled to keep up when I was invited to come along.

Bill Treichler

But I was most powerfully drawn to the Treichler family, who ran the school farm and had two sons and two daughters near my own age. At the same time they were the most inscrutable of all. They were the closest family and the most truly educated, healthy and accomplished people I had ever encountered. To say they were iconoclasts is like saying that tornadoes are windy There are some people you can learn a lot about and from right away when you first meet them. But it took me quite awhile to really understand what the Treichlers were all about

Bill and Martha met at Black Mountain College in NC after World War II, and began their married life by building a little house from recycled materials at Bill's parents' farm in Iowa. They made the conscious decision not to have jobs away from the farm until their children were grown. The family moved to Vermont only because their home farm was threatened by an Army Corps of Engineers water project. They had never had a television or even a phone at that time, and every available evening they spent listening to Bill read aloud. They read hundreds of books together this way, while the family was growing up. It was embarrassing to be invited for dinner and listen to them all talking and laughing about *Richard II* – even little John (age 8) piping up about his favorite parts. Sometimes "Pass the potatoes" was all I could contribute. Between them all they could do every kind of farming job, auto and tractor repair, and credible work in all the building trades. At the same time, the kids eventually managed to get degrees at Harvard, Cornell, and other colleges. I found all this pretty amazing, but my biggest shock was yet to come.

After I had known them for two years, Bill told me one day that the year their fifth child was born, their gross income was $600. I was stunned, and felt like someone had just hit me between the eyes with a stick of cordwood. Here were the healthiest, most capable, well-read and intelligent people I had ever met, and they had chosen a life-style that yielded them annually just $600, (probably equivalent to $10,000 today) for seven people to live on. In that moment, any formative notions I might have had about security, the value of money and priorities were shattered, and I knew I would have to start again from scratch to learn what these things really mean.

The Treichlers were more than kind to take me under their wing and include me in many of their family activities. It was perhaps the greatest privilege of my life to have a life-long friendship with Bill, Martha and their children. I learned so many things from them, probably more than I could say, even if I wanted to. But thinking about it a different way, there may be only two things I learned from them.

The first is that most people don't use very much of their potential. They allow their lives to be defined and controlled by other people and their ideas. This leads us away from genuine reality; often leads to much needless suffering and abuse; and evolves into a society where everyone must be either the hammer or the anvil.

The second is that all tasks are of equal difficulty – they just take different amounts of time to accomplish. The trick is to choose the right tasks and do them in the right order When your life builds in a positive way from one thing to the next, then it's possible to live life independent of much of the chaos and destruction we see around us now, and easily accomplish things most people believe to be impossible

I'll finish with the story that made me think of writing this entry in the first place, and another thing that I learned from Bill. He was a lifelong organic farmer never having learned any other way Bill was very successful with his farming, and improved the land in all four places where he lived and worked. I learned from Bill, so right from the beginning I never had any doubts about the soundness of the methods. From this tradition I learned the concept of seeing pests as friends and allies who can show us the way to better farming in the future. The best farmers throughout the ages have always known this, but it became one of the focal points of the modern organic farming movement through the work of Sir Albert Howard (1873-1947), during his tenure as Imperial Economic Botanist for British India. Howard wrote extensively

about his experience and conclusions in *An Agricultural Testament* and *The Soil and Health.* Through the co-incidences of war and happenstance, Bill had a unique connection with this great agricultural scientist.

"Most people don't use very much of their potential. They allow their lives to be defined and controlled by other people and their ideas."

By the time he was 18, Bill had read several British books about organic farming and had become a charter member of *The Soil Association* – one of the first English language societies devoted to the advancement of organic farming. Shortly afterward, during the Second World War, he performed one of the most dangerous jobs allotted to any American serviceman – turret gunner on the long range bombers that flew from England to Germany and, sometimes, back again. He survived 25 missions. The airbase where he was stationed, in East Anglia, happened to be near the home and estate of Lady Eve Balfour, who was also a Soil Association charter member and a close friend and associate of Sir Albert Howard. When Lady Eve found out that an American airman stationed nearby was a Soil Association member, she arranged for him to spend his off-duty time at the estate as her guest. So Bill became quite familiar with the Haughley Farm, and a friend of Lady Eve. After the war, Lady Eve gave part of the estate to the Soil Association to be used for research into organic farming. The farm was divided into three sections, each farmed in a different manner· one "conventional" (crops and livestock plus artificial fertilizers and pesticides); one "organic" (the same crops and livestock, but with no agricultural chemicals); and one without livestock (relying heavily on ag chemicals for fertility and pest control) The project (called *The Haughley Experiment*) went on for more than 10 years, and followed the health and success of many different crops and livestock through several generations. It was the best comparison of conventional and organic farming ever done, and clearly showed the deleterious effects of agricultural chemicals, especially the cumulative effects over several generations. You can read about the project in Lady Eve Balfour's book *The Living Soil* (try to find a later edition that has an appendix about *The Haughley Experiment*). Something similar should be done in this country, while there's still enough energy left to produce chemical fertilizers. It might help us to save some of that energy for better uses.

So, through European wars, guardian angels, the kindness of a British aristocrat to an unknown American serviceman, flooded farms in Iowa, and a generous dash of serendipity, I somehow became one of the guardians of knowledge and wisdom handed down for centuries, and way past my own abilities. We need more mentors like Bill, and I know I will miss him every day that I can still think and breath. The only runner-up mentor I have that's even in the same league is the honey bee. BC

Kirk Webster is a queen breeder and producer in Vermont.

MAKING MEAD PAY

PEI Beekeeper Does It!

Kathy Birt

Honey lovers in PEI can now add something unique to their list of (honey) products to enjoy these days.

Daniel Ficza of Canoe Cover Prince Edward Island, who has been making honey and commercially selling it for about 15 years, has produced his own version of honey mead.

Ficza has taken his Honeydew Apiaries business to a new level with this latest product. Always looking to produce a top quality product with his honey, this wine is no exception and is now being sought after in local liquor stores.

A tid-bit of history about mead says that in all likelihood it is the oldest alcoholic beverage known to mankind. In fact it is said in Celtic cultures, in pagan times, that the term "honeymoon" has been associated with the bride and groom traditionally drinking mead everyday for one full moon after a wedding. (About.com)

Ficza had been making honey wine for his own consumption, and wondered if marketing this wine might be another way to utilize the honey from his 400 beehives. He is able to extract between 85-95 pounds of honey per hive per year

With his license to market honey wine in PEI liquor stores secured in the Spring of 2007, Ficza had to put making the wine on the back burner while he transported his hives to various blueberry farm locations for Spring pollination. The pollination brings in the bulk of an apiary's income, so this Springtime ritual cannot be ignored.

Most Island beekeepers are paid $120 per hive, depending on just how far they have to travel to place the hives. Last Spring's pollination requirements meant a busier season for Island beekeepers with the increase of canola crops. Ficza has taken hives all the way up to Alberton, which he indicates is a full day's work.

Then there is extracting and preparing honey for market, so the honey wine took a back seat all Spring and Summer Having established markets for his honey with packers in Quebec and Alberta, he says the Quebec packer in turn sells this Island honey around the eastern seaboard of the United States.

His honey comes from Goldenrod, Aster and Clover hence he calls it Wildflower Honey and also markets it at the farm gate. It could be said that Ficza was a natural at making honey, when he began this process as a hobby 30 years ago. However, he has had some formal training over the years in a beekeeping course at the Peace River Agriculture College in Alberta. All this adds to a better product and the inspiration to utilize his honey further with the wine.

His honey wine, which he is calling Golden Drop, with his self-designed labels, is on liquor store shelves in Charlottetown, and Ficza explains the somewhat simple method of mixing the wine. "My honey wine is not made with fruit juices," he says, and adds that he makes straight mead. "This is just honey water and natural nutrients. You do your mixture, dissolve your honey, add yeast and let it ferment," explains the beekeeper A steady temperature of 20°C(72°F) is essential for fermentation.

Although he says making honey wine is not much different than making other wines, he adds that it can be a little tricky when filters clog with beeswax.

Passing some 50 stringent analysis tests by the Ontario Liquor Commission, this mead from Canoe Cove, bottled in a 750-mill size, is having brisk sales at Island liquor stores. Keeping the wine local Ficza isn't competing with any of the other meaderies in Canada. There are two in Quebec, one in Ontario, one in British Columbia and also one in Alberta.

Although, the honey wine is labeled a Canadian product rather than a PEI product, this is offset by local signage in stores just as there is for Rossignol fruit wines from the Little Sands area of PEI. BC

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Marked For Death

There are probably many ways to catch a queen, and more ways to handle her after that. When I got up the nerve to handle queens I was proud. I also created at least one five legged lady bee. She finished her duties as a ruler of an observation hive.

I was told it's OK to pick them up by the wings and then to transfer the grip by setting her on a finger She will grab this finger like a life preserver That's when you use your thumb to hold her legs. The other hand pulls out a marking pen, you grab the cap in your teeth and twist it off; you mark the queen. You gently let her paint job dry; you place her back on a frame. You are done. You breathe a sigh; you feel proud.

My good friend and teacher (of all the other beek' skills) often works side-by-side with me doing this. She uses a plastic queen-catcher and a plastic marking tube. I know she cringes when I reach for a queen; I smile inside. I don't like to see her unlimber all that plastic. This has been going on for years.

A few weeks ago we were collaborating in a hive inspection workshop. Accidentally, someone spotted a queen. (I hate that when I'm holding the frame!). "Let's mark her," I heard. I saw a hand twitch looking for plastic. "I'll do it." I said. (I get to rule when they are my bees). With 15 people watching I swooped in with my left hand and deftly placed the lovely lady on my right forefinger She grasped my finger like she'd read the book. She was quickly marked. It was impressive.

Sometimes you can have too much ice-cream on a cone. It can overbalance and end on the sidewalk. "Pride goeth before a fall." "Your tears are your joy unmasked. " There's more, but I'll spare you.

Preparing to release the lady I looked down. My eyes widened as I looked closer "Shouldn't she be moving?" someone asked. I had no comment as I was trying at the time to blow her up. I occasionally blow on a dead bee when my grandchild is watching. (A chilled bee will come to life someday; I'll get some respect out of that!)

As I shifted into explanations of how queens sometimes faint, the group shifted feet. I explained that it's usually only a momentary thing. I moved her gently on my palm. Ten minutes later I was running out of explanations. "Look, she's moving!." "She's breathing."

As the group watched and took pictures the abdomen of this patient came to life. Well, sort of. With a stretch of her ovipositor and a contraction, she laid an egg on my hand. This was followed by four more. While it showed life, I wasn't altogether ecstatic. It looked somewhat like the final spasms of a dying animal. The movement stopped. We put her in the shade on a frame for twenty minutes and still no joy I blew on her a few more times, put her in the hive and closed it. I was not hopeful, but had to change the subject.

A few days later when I checked, she was fine. I will continue to blow on bees. BC

Wintering Beehives

Part 1. Past Wintering Recommendations

James E Tew

A daunting assignment

A staggering amount of information is available in the colony management archival bee literature on wintering procedures. Truly, entire books could be written on this single subject; however, in this article and others to follow, I will try to condense wintering information to a manageable bulk. It would appear that honey bees are still a warm climate species. Wintering is still a challenge for them and for beekeepers.

Winter kills are (much) more numerous that they were a few decades ago

Succinctly stated, during an average Winter, the percent of Winter kills has been rising. At meetings, you and others like you have repeatedly said that Winter kills are now more common than a few decades ago. I admit that I have had to work more to keep more of my bees alive, and they still seem weak and lethargic when they do survive.

In 1915, E.F Phillips[1] wrote, *"The beekeepers of the United States lose at least one-tenth of their colonies of bees every Winter This loss is largely due to carelessness or to lack of knowledge, and it is entirely practical to reduce it to less than one percent, the small loss covering various accidents which cannot be foreseen."* When confronted with today's beehive issues, Phillips' comments appear harsh. Having not been around in 1915, may I assume that honey bees were less subjected to exotic pests and predators then than now? While it may be true that we still suffer from a lack of knowledge, I am defensive when charged with being careless. The routine mandate by speakers from the podium to *"keep your colonies strong and healthy,"* is frequently impractical. There have been runts and sickly beehives as long as people have been keeping bees. *(But there now seems to be more runts and sickly beehives – based on the published beekeeping literature.)* Lastly, it is no longer realistic to say that it is practical to routinely reduce Winter losses to around one percent. As is 1915, those days and those statistics are long gone.

The Old Thinking – The major causes of Winter losses in years past – starvation and excessive heat production

"The causes of the death of individual bees or of a colony of bees in Winter, barring unusual accidents, are only two in number· (1) Inadequate stores and (2) excessive heat production." We now know that there was more to Winter losses than those two parameters – but they remain important.

Starvation

Starvation is still a common cause of Winter colony losses. Researchers past felt that abundant, quality food stores were necessary for heat production, to sustain adult bees, and to provide for later Winter/Spring food for brood. Starvation is not as easy to address was advised in the old publications. Feeding bees carbohydrates can incite late season brood rearing rather than provide food for storage. Secondly, some colonies simply seem never to learn to use feeders or to store the supplemental food.

Excessive heat generation

I must write that *too much heat* was not the listing I was expecting from the old literature. Results of early research indicated that at hive temperatures between 57° 69°F, a normal broodless colony of bees does not form a cluster – *but the bees remain inactive on the comb.* Drop below 57° and a cluster begins to form. Drop even lower, and bees in the center begin to use muscle energy to generate heat. Ultimately, as a colony is subjected to long coldness, the insulating shell of bees begins to fail and die. As the shell becomes increasingly ineffectual, the core bees are required to produce more heat. So, it is not that the colony produces so much heat that it cooks itself, but rather that the colony is required to produce high levels of heat to make up for decreasing cluster size.

Bee Excrement accumulation

As the wintering cluster eats an ever increasing amount of food and if the food has indigestible components to it, bees will accumulate and store increasing amounts of feces in their rectum. In 1915, it was felt that high heat production resulted in large food stores consumption which resulted in feces accumulation. If the heat requirement was great enough and feces levels rose high enough, the bees could no longer contain the waste products and would defecate within the colony. This condition was called dysentery by olden beekeepers.

Now, in 2009, we know this line of thought to be only partially correct. No doubt small clusters would be required to eat disproportionately high levels of stores which would result in feces accumulation. Cleansing flights would be required. But a great part of this problem could very well be digestive pathogens such as those caused by Nosema infections or viruses. So we know more about the hive health than scientists past, but the concept of increased food consumption causing increased need for

[1]Phillips, E.H., 1915. *Outdoor Wintering of Bees*. USDA Farmers' Bulletin #695, October 12, 1915. 12pp

Four colonies on wintering platform base.

Four colonies prepared for sawdust insulation and packing.

cleansing flights is still appropriate. With this in mind, an issue that is relevant today is corn syrup – is it a good supplemental wintering food source or are there problems with it? Currently, we don't have clear answers.

Availability of young bees in the Winter cluster

Honey bees emerge into the world with a fixed amount of life's energy – somewhat like a dry cell battery Clearly if this reasoning is correct, young bees are needed to survive the prolonged periods during Winter months. Brood rearing late into the Fall months assures the colony a good population of young bees for this purpose. The dead bees that accumulate – even within a healthy wintering colony – are indicators of old bees dying as the heat generation processes uses the last of their energy

Spring Dwindling

In the beekeeping literature, Spring dwindling has had many descriptors. Colony Collapse Disorder (CCD) may or may not be a modern name for conditions that have been called Spring Dwindling, Autumn Collapse, Vanishing Bee Syndrome, or Disappearing Disease. In the early 1900s, Spring Dwindling was expressed by colonies that survived until Spring, but then slowly dwindled maybe to the point of dying. The authorities of the day felt that the heat production required of bees during the Winter had used them up and that the balance of young bees versus older bees was awry The colony had gone into Winter without enough young bees. Again, current guesses are that other factors such as genetics or disease may be playing more a role than simply colony make-up.

The enclosed container Note that entrance reducers are still open.

Effects of a good queen

The queen's role was clear in 1915. She provided the young replacement bees for the season – including the Winter season. She was able to increase brood production rapidly in the Spring. But other than this important, indirect contribution, she played no direct role in the actual wintering process. Today, that concept is still mostly believed – but not quite. The queen does not have a physical role in the wintering process, but the genetics she extends to her offspring are critical in the colony being able to survive the Winter

The physics of weak colonies

A large cluster is, in all ways, better suited to survive the Winter than a smaller cluster[2] There are fewer bees for insulation duty The interior bees must generate more heat so they use their resources faster As the interior bees increase the core cluster temperature to offset a reduced cluster insulation layer, the interior temperature of the brood nest is raised to the level appropriate for brood production. Even today, beekeepers can see brood production in small clusters during cold months. The old recommendation was to – so much as possible – limit brood production until the bees had free flight. Whether the brood production in a small cluster was unintentional or was an effort to produce brood for replacement bees, the final effects were the same – the

[2]Since the surface of a spherical cluster is proportionate to the square of the diameter, while the volume is proportionate to the cube of the diameter, it follows that a large colony cluster has a relatively smaller surface for radiation of heat than does a small one.

Bee colonies wrapped in tar-impregnated paper.

colony used its resources even faster and probably died as a result.

Winterizing colonies

In addition to a healthy colony and a good queen, colony packing was routinely recommended in the early 1900s. On many occasions, I have wondered why that recommendation passed into obsolescence. We insulate our homes, our work places, our clothes and our automobiles – yet bee colonies didn't need help. The arguments for and against Winter packing are extensive. Labor, bee physiology, and climatic conditions are all fundamental areas of discussion when considering whether or not to pack. It was stated that a beekeeper cannot insulate a colony too much nor can a colony be too strong going into Winter

Packing hives for Winter

The U.S. beekeeping industry went through a period of time when colonies were packed in groups of four[3] The phase went (I estimate) from the late 1800s through the late 1930s. Photos and instructions are commonly available, but I have never seen the procedure used to winterize colonies. In the warm months, four colonies sat upon a platform that would become the base during Winter months.

About the time of the first killing frost, the colonies went into the packing phase. Sawdust or wood shavings were frequently used as insulation materials. Rags, leaves, and paper were also common materials. Sawdust would hold escaping moisture so colonies had to be packed properly Packing should NOT be done after Thanksgiving. It was found that late packing resulted in the colonies increasing colony temperature and initiating brood rearing.

The packing crate was collapsible and was reassembled with screws. The four colonies were raised to sit on a simple 2x6 frame. Hive entrances were modified to be longer and to align with the entrance in the packing crate. The four crate walls were attached, and sawdust (if used) was loosely poured under, around and on the four colonies. An air space was left at the outer cover of the crate so the container was not packed full.

The final container was a large "doghouse" looking box with a flat lid. Entrances to the outside were present in order to allow the bees free flight on warm days.

Unpacking wintering colonies

Surprisingly, there was little hurry to unpack the colonies. May 15 would have been acceptable but leaving colonies packed well into Spring was not uncommon. If the beekeeper needed to check the colonies, some of the insulation was removed.

Doubled-walled colonies

In 1915, wintering colonies in two deeps was just becoming a reality It would seem that for a while some colonies were packed while others were left unpacked in two deeps. For a while, companies such as Root and Dadant manufactured hives that were double-walled and insulated with chaff. Occasionally photos are found showing these "puffy" hives with oversized hive bodies and oversized outer covers[4] For photos and more detail, search double-walled bee hives in *The ABC and XYZ of* bee *culture: a cyclopedia of everything ... Google Books Result.*

Later packing procedures

In more recent years, various corrugated board boxes (wax impregnated) were available. These boxes were slipped over the wintering colony leaving appropriate entrances for bees to exit when weather allowed.

Still another procedure for providing some insulation was to wrap colonies in black tar impregnated paper (roofing felt paper). The procedure was simple and the blackness was thought to absorb sunlight thereby providing solar warmth. Slats were tacked into the tar paper to hold it in place and entrances – both upper and lower were provided.

Winter in the hive

Winter is the long, quiet time in the hive. Yet the bees are fighting for their lives. Sometimes beekeepers can help while at other times their assistance is harmful. In upcoming *Bee Culture* articles, I will address topics such as indoor wintering and Winter cluster biology When does packing help and when does it harm the bees? Successful wintering is a major aspect of successful beekeeping.

Visit **www.honeybeelab.com** for additional photos and reprints of some of the pamphlets I used in this article. BC

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[3]Phillips, E.F. 1918. *The Preparation of Bees for Outdoor Wintering.* USDA Farmers' Bulletin 1012. Washington, D.C. 24 pp.

[4]Phillips, E.F. 1922. *The Insulating Value of Commercial Double-Walled Beehives.* USDA Circ. 222. Washington, D.C. 10 pp.

A Honey Heater For The Hobby Beekeeper

Tim Celeski

How To Build Your Own Great Small Honey Heater

How To Build A Great Small Honey Heater

As all beekeepers know, most honey types will crystalize or sugar after a period of time. The surest way to remedy this problem is with heat. Additionally, warm honey is much easier to pour and bottle But, it's very important to apply the heat carefully and precisely And, like most other beekeeping devices, beekeepers have found all kinds of creative ways to heat their honey A water jacketed bottling tank, bucket and barrel bands are the common commercial tools to heat the honey One of the most clever solutions I've seen is by a member of our association who puts his sealed buckets into his hot tub over night with the tub cover attached to keep the buckets from bobbing up. Water is thermally quite efficient. Works well.

Short of owning a hot tub, the most common device is that a lot of beekeepers convert an old non-functioning refrigerator into a honey heater by mounting a light bulb at the bottom and controlling the temperature with a rheostat style temperature controller Though this works well for those with several dozen hives and the space to store a spare refrigerator, it isn't practical for us who work on a smaller scale. It's with that in mind I set out several years ago to design a honey heater that would work for myself and other hobbyists.

Completed honey warmer.

Version One

Starting with idea that the refrigerator and light bulb based heaters worked pretty well, I rationalized that making it in miniature might make sense. So, I bought a very used, very beat-up metal-clad Coleman cooler at a thrift shop for $2.37 I set the cooler on it's short side and built a small platform to rest buckets and jars on and to allow room below for a lamp base and a small 15 watt bulb. All of this was hooked up to a light dimmer inside an electrical box mounted to the top. I also put in an indoor/outdoor thermometers to keep an eye on things. I'd set the dimmer to near full over night and then down to about 1 3 in the morning. After a couple of days my honey would be warm and the crystals gone. A little funky but the total cost was just $10.

This version had several problems, and I don't recommend it. For one thing the lamp dimmer is not really a heat controller and so the temperature was hard to control and really going all over the place to the detriment of the honey Additionally, unless the heater was not carefully monitored it was potentially unsafe. Finally it wasn't even ideal from a practical standpoint. For one thing, loading it from the front was no fun. And, though I could heat up a number of jars or even one of the square four gallon buckets of honey I prefer for bulk storage, I couldn't fit in the occasional five gallon buckets I get when I need to buy the additional honey from other beekeepers. Time for a new design and better temperature control.

Attach the lamp bases to the sides of the platform.

Version Two
The Right Cooler

A few years ago a new type of vertical cooler was introduced by Igloo and when I saw it I knew that it was exactly what I needed to create a much better honey heater These coolers come in two sizes: the Igloo Ice Cube 50 and the Igloo Ice Cube MaxCold 70 Roller I took a lot of measurements and found that for enough room for lights, the base and buckets up to five gallons the latter one is just the right size. And, it comes with the added benefit of being on wheels so you can move it around easily I've found that these cost from $38-$70, so shop around.

Constructing the Base

To keep as much room as possible in the cooler for buckets, the base has to be very low The base I've designed is a total of 3" high, uses two bulbs for a heat source and allows enough room in the cooler for five gallon buckets to be heated. But, the bottom of the cooler presents several challenges with its various bulges in

The new base.

Attach the ETC to the lid.

Drill hole in lid to pass through the sensor. Wrap extra cable around handle.

the floor to allow for the cooler's axel and wheels. Therefore, there are some important dimensions that should be followed.

Being a furniture maker by profession the base for my own heater is overbuilt, made out of mahogany and uses very strong joinery (Sorry I can't help myself.) The base needs to be very strong in order to support up to a 60 lb bucket of honey I recently redesigned it for construction by anyone with just a little woodworking skills and average tools. Though it can be made out of pretty much any ¾" stock like pine or fir there are some advantages to using ¾" plywood if you have access to a table saw to cut it. Since it takes only a small piece of plywood, consider building more then one base at a time by working with other beekeepers in your local association who might also want a heater and just might have the tools you don't have. If you're ambitious a full sheet of plywood can make 16 bases and bottle shelves.

Though this article covers what you need, to help construct the cooler, a complete downloadable drawing and plan for the base with all the dimensions, materials and cutting lists, plans for removable bottle shelves made from left over plywood and additional design details is available for free from my website at www.beegeek.com.

This new base is made up of strips of ¾" plywood cut from a piece that is 8½" x 32" to these sizes:

4 pieces 1¼" x 14"

2 pieces 2¼" x 11" with one end cut at 45°

1 piece 2¼" x 10¼"

Using the photos as reference, assemble the base with screws and glue. Pre-drilling will assure that the plywood doesn't split. You'll need 1-5/8" and 1" drywall-type screws. Use the larger screws except as noted. Start by attaching the 10¼" piece to the square side of the two 11" pieces. Next, center and attach two of the 14" strips to the "U" shaped assembly, one on each end. For stability, add an extra screw to the strip attached to the bottom of the "U" And, note that you need to use the 1" screws on the tip of the 45° ends. Using left over 1 ¼" scrap as spacers attach one of the remaining strips next to the mounted strip on the square end. Do the same with the final strip on the 45° end. This should leave you a larger gap in the middle as shown in the photo.

Wiring the Base

Now that the base is complete you need to attach the electrical components and wiring to it. Because of the limited space underneath the warmer base, the bulbs mount in what's referred to as a lamp base of a specific kind as shown in the photos. Though there are two kinds of bases that are small enough that will work, I encourage you to use the two-part white porcelain type as they accept the heat better and cover up the exposed wiring.

Attach the two lamp bases by centering them in the large opening of the warmer base exactly 1½" from the bottom of the base to the center of the lamp base. Being that the total thickness of the base is 3" the bulbs will then be exactly half way between the bottom and top. Next, you'll hook up each lamp base by using two pieces of heavily insulated two-wire stranded electrical wire (sometimes called lamp cord) that are about 14" long. Pre-strip the insulation off of both ends of the wire so you can attach them up to the terminals on the two lamp bases.

To make this assembly safe you need to attach the wires to the wooden base. An easy way is to use modified plastic clips designed for attaching coax TV cable to walls. These come with nails, so just pull them out and drill the holes out with a 1/8" drill bit so you can use 1" screws to attach them to the warmer base leading toward the 45° end as shown. Once done, add a couple of cable ties to hold the two pairs of wires together in the center on the back.

To complete the warmer base, stability and flatness is added by attaching galvanized hardware cloth (coarse screening) sized to 13¾" x 10½" to the top. It can be any gauge you like, but as beekeepers we make good use of the 1/8" size for various things like entrance screens so you might have some around or want to pick some up anyway Use a heavy duty staple gun to attach it.

Controlling the Temperature

Since you're making a really nice heater, it should have a really nice temperature controller When designing my new one I researched what craft brewers used and found they favor the Ranco electronic temperature controller (ETC) products for their digital control and accuracy I figured, if it's good enough for the very fussy process of making beer it's good enough for beekeepers to heat honey These come in a confusing ar-

Completed interior of heater

ray of models for different voltages so make sure you get the one intended for 120 volt use. Use model. ETC 111000-000. Though I bought mine locally a few years ago, I've found a new low-cost internet source for them at www.rancoetc.com. They cost $60. Some internal and exterior wiring is needed and Ranco's wiring instructions are rather cryptic. So, if you're all intimidated, they'll send it to you fully pre-wired for an additional $15.

The ETC needs to be attached to the cooler and the best place is on the lid centered near the back. Once you've taken measurements to position it as shown, I find it's easiest to attach by removing the cover of the ETC (careful, as there are wires in the cover) and attaching it to the lid through the four screw points with 1" screws. Make sure you're careful to not damage the electronics inside and don't over tighten these screws as they're just being screwed into plastic. Once firmly attached, put the cover back into place. Now that the ETC is attached be very careful because when the lid is open the cooler is very top heavy and will tip over So, put the cooler next to a wall for this final part of assembly Once warmer base is in place this won't be a problem.

Wiring the ETC

For the rest of the hook up of the ETC you need to attach all the wires to the cooler, attach the sensor and hook up power to the lamps inside. I've found that the best place to attach all these wires is on the back of the cooler around the roller handle. Because the sensor cable is so long, rather then cutting it and re-attaching it inside the controller I just wrap the excess around the handle as shown and attach everything to the cooler with cable ties. Because of the tight gap between the handle and the cooler you can temporarily detach it by removing the four screws holding it on.

Next, you need to get the sensor inside the warmer After doing lots of temperature tests with a very accurate thermometer inside the warmer and in the honey being heated, I've found the best location for the sensor is centered just underneath the lid. To get it inside, drill a ¼" hole centered and ¾" up from the ledge on the back of the lid. After feeding it through, center it on the lid and use two or three of those coax hold down clips with 1" screws like were used to attach wires to the warmer base.

The final part of the hook up is to get power to the lamps. If you bought the pre-wired version of the ETC, you'll need to feed the wire with the female plug along the handle as shown and attach it with more cable ties. Next, making sure you leave extra wire to hook up the lamps inside, cut off the excess wire with the female plug then feed the wire through the drain hole at the bottom of the cooler Note that the top of the handle makes a nice storage place to wrap up the power cord you'll plug into the wall later

All that remains is to strip the ends of the wire from the lamp power cord that's now inside the warmer and then attach it to the two lamps. With the completed warmer base inside and standing vertically attach the black wire from the power cord to one wire from each pair of wires that lead from the lamp bases with a wire nut. Do the same with the white wire from the power cord with the remaining wires from each lamp base. To finish up add more cable ties to attach all three of these wires together into a stable unit so they won't pull apart. The wiring is now done.

Completing the Heater

To complete the heater it's important to protect the cooler from the heat inside with radiant and thermal barriers. This is essential to protecting the plastic interior of the cooler, so don't skip this part. Start by cutting a 14 x 9½" piece of galvanized roof flashing that will fit in the bottom of the cooler Because the cooler is rounded inside, you'll need to round a couple of the corners to get it to fit. While you're at it, cut another piece 14" x 11" that will eventually rest loosely on top of the warmer base's screened top and underneath your buckets or bottles of honey It will need to be rounded on all four corners to fit inside the cooler This piece helps distribute the heat from the bulbs and is useful for catching the inevitable drips from the warm honey sitting on top of it.

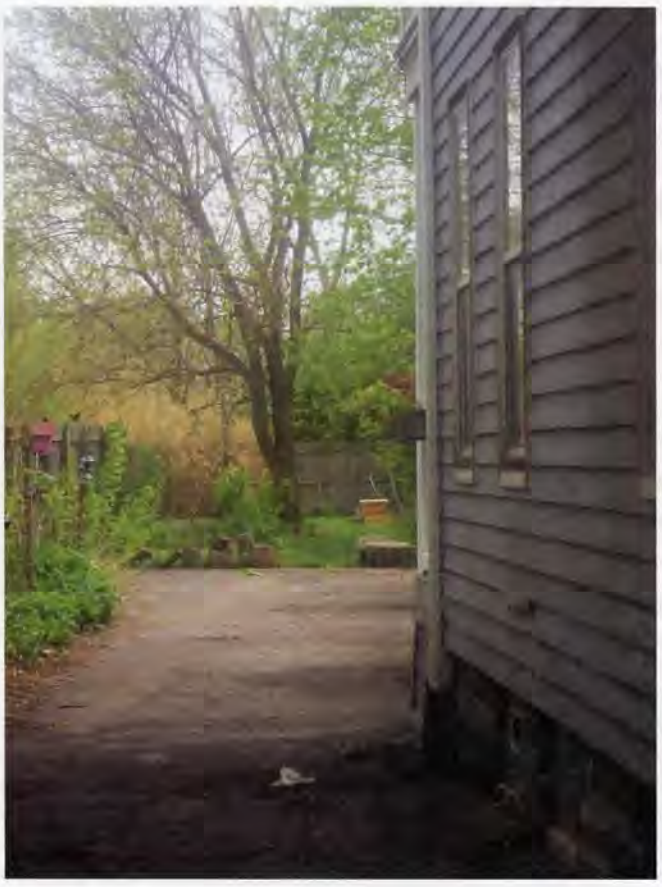
Perfect for the function of a thermal barrier while also working as a heat sink that retains the heat from the lamps is a 8 x 10" ceramic tile that sits on top of the piece of metal protecting the bottom of the cooler It just fits inside the two supports of the warmer base.

Setting it Up

For bulbs, use two 40 watt heat-resistant appliance bulbs and you're ready to go. The ETC is very easy to set up once you plug it in. Since this is an ungrounded device, plug it into a GFCI circuit if you have one where you intend to use it. You first set desired temperature. To de-crystallize honey I've found that a temperature of between 95 and 110° works depending on honey type, how solidly it's sugared and whether it's in bottle or bucket form, etc. Then you'll be prompted to set the temperature gap before the ETC turns the lamps back on when it cools down. I set mine to 2° Usually overnight is enough time to de-crystallize bottled honey A little longer for a solid bucket. Finally, note that unless you add a switch, the only way to turn the heater off is to unplug it. So, make sure you unplug it when not in use.

Your new honey warmer is now complete. Now there's no more excuses for your honey to be anything but crystal clear Enjoy! BC

To help construct the cooler, a complete downloadable drawing and plan for the base with all the dimensions, materials and cutting lists, plans for removable bottle shelves made from left over plywood and additional design details is available for free at www.beegeek.com



The Flavors of Urban Beekeeping

Gwen Rosenberg

There's a different flavor to City Bees

In the small town where I live, there was a terrific train crash over the Winter that cracked a concrete support for the bridge, and sprayed coal for hundreds of yards. Something like 14 cars were derailed, and emergency railroad crews spent weeks repairing the damage. No one was hurt in the accident, but the river bank is still smothered in loose coal, and a large stand of black locust trees was toppled into the Cuyahoga River In towns like mine, train wrecks rank right up there with double homicides on the public interest scale. The conversation for the next 18 months will invariably center around this train incident, and we'll all find an excuse to monitor the repair effort while walking the dog.

Around the same time the train was violently lurching from its track downtown, the honey bees in my backyard were lurching from the cold Winter and finding comfort in a heavenly flower garden somewhere else. I made the disappointing discovery about two months afterward when the ice pack finally thawed. Luckily for me, the bees left behind what I have taken to calling "haunted honey " This particular kind of honey results when the bees have long since gone, but the honey remains. Haunted food is only available from honey bees. Imagine if my little brown hen died in December, and come March I'm bragging to the neighbors that she left a double yolk-er in the coop. "Deviled eggs, anyone?" No thanks, that's a different kind of exorcism altogether

Haunted honey is a parting gift from the bees to the beekeeper I think of it as a hostess present for the hospitality afforded them in my backyard. This year's haunted honey crop (I must be a very gracious hostess, because I get a lot of haunted honey) came from the springtime blossoms of the black locust trees that were wiped out in the big wreck. There won't be a vintage like that ever again. When I shared the honey with neighbors, I was sure to brag about this connection to the train wreck. For most people, it's fascinating for them to know where bees are foraging and what trees, flowers and gardens have contributed to a single jar of honey If they never noticed the black locust trees before, they are sure to miss them now

In rural settings, train wrecks and honey flows aren't as easily noticed over the miles of countryside. A dozen trees in bloom won't make a much of a dent in the mind of a beekeeper looking out over 400 acres of crops and wildflowers. A jar of honey in the country is impressionist art, beautiful but generally blurry Its flavor imparts a blending of great swaths of flowering landscape across an open horizon. The bees enjoy an anonymous labor on the property of strangers. In town, I consider my honey in photographic detail, as opposed to impressionistic brush strokes. I swear I can taste the blackberry blossoms from behind the garage. I can taste the quince next door, and the flowering crabapple on the tree lawn across the street. I look for bees in every window box, and in every concrete planter tended by boy scouts earning merit badges. My neighbors call me over and ask me to identify if it's *my* bee in their mint patch. They want to know if it's *my* bee in the cucumber blossom, *my* bee in their kitchen, *my* bee on the dandelion, *my* bee in the swimming pool My bees can't get away with anything.

As the two lane road becomes four and six and eight lanes, the acres shrink into lots, and the vegetation is condensed into smaller and smaller spaces. The vegetable garden is tucked next to the driveway, grape vines are trained up the chain link fence, and the herb garden is in

a container on the patio. As a consequence of the scarcity of full sun and soil, all of these nectar sources have a much more personal connection to urbanites. If you only have a few square yards, it's not uncommon to dote over a particular tree or sunny garden spot. Green thumbs abhor a vacuum just as much as mother nature does, and they tuck flowers between concrete slabs. And they love them.

My grandmother still talks wistfully about the pear tree that grew in her yard decades earlier I dared my brother to eat the crab apples from the tree that was our swingset, while we dined on currants from the hedge between our yard and the driveway next door In the neighborhood where I grew up, my accordion teacher could tell me who was president the year the two towering pear trees were planted in his yard. The school yard is shaded by the maples planted as monuments to the young men lost in the World Wars. This is not to say that the rural landscape does not share affection for trees and gardens, merely that there is an abundance of sentimentality emanating from the 40 families that share 10 acres, compared to the solitary farmhouse on 40 acres.

The burgeoning green movement is really just a renaissance of a type of urban agriculture that existed in most big cities, and in many still thrives. In the Midwest where I live, immigrants moved into the neighborhoods closest to the factories. They planted the trees, gardens and brambles that today's city dwellers have suddenly discovered are missing; gone with the factories. Pigeon lofts, chicken coops, beehives, and rain barrels are all just throwbacks to the big families and the grandparents bearing zucchinis that we remember living on our block.

Beekeeping in this environment is not about maximizing honey production, but being part of the rejuvenation of what was lost in the era of the par-three lawn. It's a nod to every little old lady who swept the helicopters from the street in front of her house, and the little old man who tended to a sour cherry tree in the yard, so she could bake him a pie.

The beekeeping clubs have been witness to this urban beekeeping mania, but I don't believe they have completely grasped the different mindset of the urban beekeeper I'm so sick of hearing that it makes no difference if you plant a flower garden near a beehive because "they'll just fly over it." A.I. Root had a grape arbor over his hives and no one derided him that grapes don't need honey bee pollination. Bees in the urban setting are part of a larger cultural dynamic. The bees aren't livestock. They are closer to beneficial pets. Flowering window boxes and weeds along the highway median may not be your idea of agriculture, but the resulting honey is just as sweet.

I'm not worried about outyards, grafting queens, or pollination schedules. I'm looking for my bees on the sour cherry tree I planted when Obama was president, and contemplating how the accidental destruction of a dozen black locust trees has changed the flavor of the neighborhood. BC

Gwen Rosenberg keeps bees, chickens, dogs and little boys at her home in Kent, Ohio.

NATURAL REMEDIES

More Plants That Are Good For Bees & People

Abbas Edun

Annatto

Bixa orellana is a member of the family Bixaceae (achiote); it is also known to botanists as *B. arborea* Huber and *B. katagensis* Delpierre. Its original Tupi[1] name is Urucu, and it is known by many other names including Aploppas, Bija, Lipstick Tree, Shambu and Sinduri.

This evergreen tree requires a frost-free, warm, humid climate and a sunny location. It is pantropic[2] in cultivation and grows from Argentina to Zanzibar In Africa it thrives from sea-level up to an altitude of about 6,500 feet (2000 m.). Optimum conditions for growth are a mean temperature of 20-26°C, an average annual rainfall of 50-80 inches 1250-2000 mm.), well distributed over the year, and a warm season in which the seeds may ripen. In the absence of sufficient rainfall, irrigation may be necessary, but excessive flooding is harmful to the growth of the plant.

Annatto needs little care and grows on almost all types of soil, but does best on a well-drained, neutral and slightly alkaline one. It may be of assistance in regenerating fertility in degraded land where rainfall is not less than 40 inches 1,000 mm.) per annum, and it may become a larger tree if planted in a deeper and more fertile soil, rich in organic matter However, it flourishes on limestone, where the topsoil is only a few centimeters thick and overlies a coral base.

B. orellana is a small tree or shrub that grows to about 16 feet (five m.) in height, but if given a lot of room, it generally branches out profusely near the ground with a dense, spreading crown. Its subterranean morphology is typical of dicotyledonous plants, with a main taproot developing several secondary and tertiary laterals. The stem is smooth, lenticellate[3], tough and sometimes fissured in older trees. The bark is light to dark brown and the diameter of the stem may reach about four inches (10 cm.).

The leaves are about 2½-7 inches (six to 18 cm.) in length. They are simple, alternate, palmately veined from the base and have a long petiole. The pink flowers are borne in terminal panicles, each with a corolla of five free, obovate, pink petals ¾ 1-5/8 inches long (two to four cm.), surround the numerous pink stamens. The plant has extra-floral nectaries on the stem at the node and on the peduncle of the flower and fruit which are visited by bees for the copiously produced pollen, the main floral reward[4]

Annatto produces showy ovoid, red fruit capsules covered with soft spines. The capsules open at the tip when ripe and exhibit two double rows of three to four dozen bright red seeds. The sarco-testa of the seed contains the red pigment bixin, a carotenoid of commercial value[5] There may be variation in the cultivars which are produced from the seeds as a result of the plant being cross-pollinated.

Conventional propagation via cuttings is limited by the intense leaching of a gummy substance and phenolics from the cut ends, which impede rooting. Hence, in vitro propagation of B. orellana may be a better way to get more planting material.

Some native tribes in the rainforest of South America have been using the entire plant medicinally for centuries. They make tea with the young shoots and use it as an astringent and an antidysenteric, and to treat fever and hepatitis; it is considered an aphrodisiac for the increase of libido. An infusion of the leaves is used to treat liver disease and skin problems. The foliage and roots are also believed to be good for the digestive system. The natives make a tea of the flowers to stimulate the bowels and aid in elimination as well as to diminish phlegm in the newborn. An extract of the leaves and branches may have strong antivenin activity for snakebites, and the roots are thought to be antitussive.

The seeds are slightly purgative, are said to be effective against kidney diseases, and as an expectorant. In some African countries a decoction of the leaves is taken to stop vomiting, as a gargle for sore throat and tonsillitis, and as a bath for the relief of muscular pain.

Annatto.

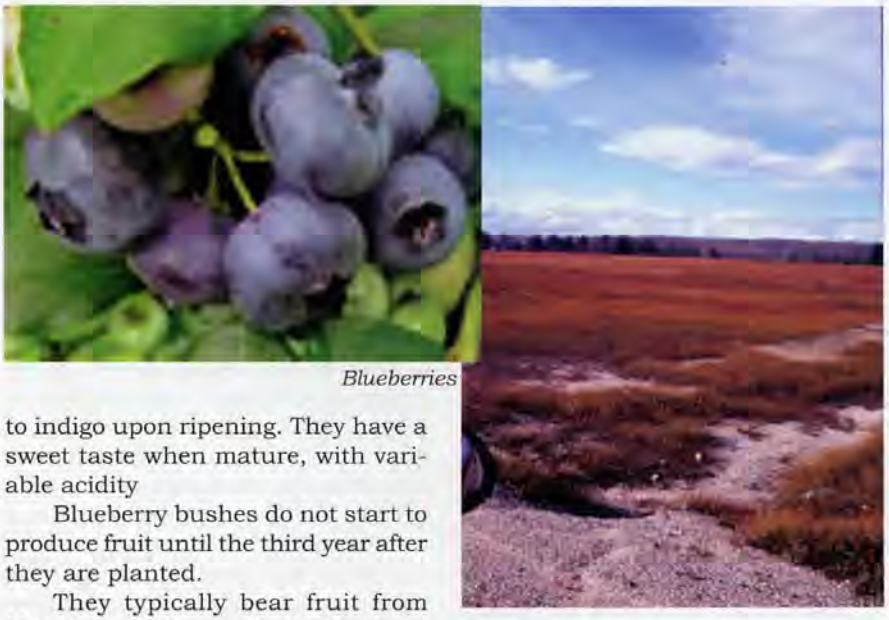
Blueberry

A healthy immune system is important regardless of our age; it helps to protect us against infections from bacteria and viruses. The types of food which we consume make the largest contribution to such a system; blueberries are very helpful in this respect.

Vaccinium is a genus of ericaceous plants which includes blueberries. The latter are slow-growing, long-lived woody perennials; they are closely related to azalea, cranberry, heath, heather, huckleberry and rhododendron, many of which also inhabit temperate climates. The two most common types of blueberry are the highbush (*V corymbosum*) and lowbush or swamp species (*V angustifolium* Aiton), both of which are native to North America. The highbush varies in height from six to 20 feet (180–600 cm.) and the lowbush from one to three feet (30–90 cm.).

Blueberries have soil requirements which limit the areas where they can be produced; the soil should be well drained but moisture retentive. They grow best in wooded or open areas, and thrive in porous acidic soils such as sandy loam, clay or coarse sand high in organic matter Blueberries require a soil pH of 4.5 to 5.5 for good growth and optimum fruit production. Soils higher than a pH of 5.8 can cause iron chlorosis, and reduced growth and yield. Because the plants normally lack root hairs they require frequent watering; this rather stringent need causes many growers to apply liquid or soluble fertilizer when irrigating. Blueberries were once grown only on rocky or sandy barrens and peat bogs, but production is now moving into areas of mineral soil.

The leaves are mostly deciduous, but in mild Winters they are sometimes evergreen, ovate to lanceolate, and alternate. They are from half an inch to three inches (one to eight cm.) long and one fifth of an inch to 1½ inches (0.5 – 3.5 cm.) wide. The fruits develop from racemes of pale pink, red or white bell-shaped flowers which are single or in small, dense clusters at the tips of branches, and appear late in May or early in June. The fruit is a false berry[6] one fifth to half an inch (0.5 –1.5 cm.) in diameter, with a flared crown at the end, they are pale greenish at first, then reddish-purple, and finally change



Blueberries

to indigo upon ripening. They have a sweet taste when mature, with variable acidity

Blueberry bushes do not start to produce fruit until the third year after they are planted.

They typically bear fruit from May through October in the Northern Hemisphere. The bushes are prevalent in many areas of North America, primarily in Canada, and in Maine, Michigan New Jersey and Oregon south of the border They are being grown commercially now in much of the southern U.S.

The plants are self-incompatible; in order for a blossom to develop into a fruit, the pollen that is produced by one flower must be transferred to another one. Effective pollination requires strong colonies, and results in higher and better quality yields. The plants benefit from crosspollination between two different kinds of shrubs and plants. It is therefore advisable to plant them in groups of two or more varieties which flower at about the same time. Insects, mainly honey bees, are essential for transferring pollen between compatible varieties. Pollination is so important to this crop that a cold Spring could diminish the ability of the bees to pollinate, and reduces the yield.

A lot of intensive work is done by beekeepers to prepare their colonies early in the year to achieve peak population during the blooming period of blueberries. The nectar gathered from the flowers of the blueberry bush makes a honey which is typically light amber in color and has a moderately fruity flavor with a delicate aftertaste.

The best way to experience the taste is to let the honey rest on your tongue for a short time. Some people can actually experience the taste of the fruit in the honey

Blueberry honey has a tendency to crystallize, but this does not affect the flavor or quality Crystals may be dissolved by putting the jar in warm water, or for a few seconds in a microwave oven.

Recent studies have shown that the plants are rich in phytonutrients which may act as antioxidants, affect hormone metabolism, stimulate enzyme activity and prevent potentially harmful DNA replication. These actions are associated with a variety of health benefits, including the potential to reduce the risk of some cancers and promote healthy aging. Researchers at Rutgers University in New Jersey have identified compounds in blueberries called proanthocyanidins that promote urinary tract health and reduce the risk of infection by preventing bacteria from adhering to the epithelial cells that line the walls of the urinary tract.

Buckwheat

Despite its name, buckwheat (*Fagopyrum esculentum* Moench), family Polygonaceae, is actually a dicotyledonous herb. It is a fast-growing annual, native to central Asia, that does well in acidic, low-fertile well drained soil. Too much fertilizer, especially nitrates, will reduce yields. In warm-temperate climates, it can best be grown if sown late in the season, so that it will bloom in cooler weather The presence of pollinators greatly increases the yield of seed.

The plant grows to about two to four feet (60-120 cm.) tall, and has a shallow tap root system, with numerous laterals, extending to three


Buckwheat

to four ft. (90-120 cm.) in depth. The single stem is hollow and its surface varies in color from green to red, turning brown with age.

Its many branches bear alternate heart-shaped leaves which are up to four inches (10 cm.) long and three inches (7.6 cm.) wide. They are cordate or sagittate, indented at the base, and often taper abruptly above the middle. Their margins are smooth or slightly undulating. The lower leaves have slender petioles, while the upper leaves are sessile.

Buckwheat has an indeterminate inflorescence. Flowering begins about three weeks after the seeds are planted, and may proceed prolifically for another three weeks, before gradually tapering off as the plant matures. At its peak, a buckwheat field in flower presents a striking blanket of white petals and a pronounced aroma that some people find unpleasant.

The fruits, three-sided achenes similar to those of sunflower, have a single seed within a hard outer hull, and are produced in clusters that arise from the axils of the leaves, mostly at or near the top of the plant. The seeds are ground into meal and used as food, particularly in pancakes, because the flour does not produce bread of a satisfactory quality

The flowers, which open at about 8 a.m. in north temperate latitudes, secrete nectar in copious amounts early in the day, and at that time are highly attractive to honey bees. The flow lessens towards noon, and during the afternoon the plants are usually abandoned by the bees. The prolific flowers have made the crop a good nectar source for beekeepers, and pollen is also collected by them.

A colony of bees having access to a field of buckwheat flowers may collect up to 290 pounds of nectar from an acre and store up to 15 pounds of honey daily The nectar makes a dark colored honey with a strong flavor that is usually relished only by people who are accustomed to it; however there is a greater demand for this honey than can be supplied.

The medicinal qualities of buckwheat have been recognized in the Far East for centuries. It contains a wide range of flavonoids, minerals and vitamins. It is a good source of dietary fiber, magnesium and manganese, and its protein content comprises all of the eight essential amino acids, including lysine. Researchers at the University of Wisconsin have identified the mechanism behind its protein ability to reduce cholesterol absorption by 47 percent.

The plant is nutritionally beneficial because of its high phenolic content and antioxidant activity Its health-promoting qualities are remarkably high, making it a crop of quality It contains two medicinal substances, rutin and D-chiro inositol (DCI), which are not to be found in significant concentration in other foods. Its rich supply of the former, a phytonutrient, helps us to maintain good health by extending the action of vitamin C; rutin also acts as an antioxidant, and strengthens capillary walls, reducing hemorrhaging in those who suffer from high blood pressure, and increasing microcirculation in people with chronic venous insufficiency DCI is a compound that plays a significant role in glucose metabolism and cell signaling. Buckwheat may prove useful in the future treatment of diabetes because of its DCI content. BC

Abbas Edun has been keeping bees in Ontario, Canada since 1979.

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[1]One of the main ethnic groups of Brazilian indigenous people. They first inhabited the Amazon rainforest, then spread southward along the Atlantic coast.

[2]Distributed throughout the tropics. It has a wide heterogeneity in its botanical forms; it grows as shrub, small, medium-sized and large tree in different localities, as in Bangalore, India.

[3]A lenticel is a porous aggregation of cells within the structural surfaces of the stems, roots, and other parts of vascular plant. It functions as a pore, providing a medium for the direct exchange of gasses between the internal tissues and atmosphere, thereby bypassing the periderm, which would otherwise prevent this exchange of gases.

[4]The nectaries on the stem are active only as long as the leaves are young, while those on the peduncle function from bud stage to maturity of the fruit.

[5]The sarco-testa is the outermost fleshy covering of the seeds. Annatto is the name of the crude extract; bixin and norbixin are the main pigments contributing to the color

[6]A false or epigynous berry is a pulpy, juicy, indehiscent accessory fruit created in certain plant species with an inferior ovary In these species the floral tube (including the basal parts of the sepals, petals, and stamens) can ripen along with the ovary, forming the false berry.

Colony Collapse Disorder
The Sign Of Things To Come? Part 2

Ross Conrad

Our future, which is intimately tied to the Earth s future, depends on what we choose to do on personal, regional, national, and international levels as a society.

Faulty assumptions

One reason for the current chemical regulatory mess that has allowed our bees to be negatively impacted (see Part I in the June *Bee Culture*), is that regulated chemical industries have influence over the formation of the regulations by which they are to be governed. In addition, our legal and regulatory systems were never designed to limit the accumulation of small impacts. Instead, U.S. law relies on cost-benefit analysis to justify individual impacts, a practice that has become obsolete as it destroys the planet as a place suitable for honey bee (and human) habitation.

In his 1980 book, Overshoot, William Catton, Jr states, "Infinitesimal actions, if they are numerous and cumulative, can become enormously consequential." This statement refers to the problem of cumulative impacts where actions that are harmless or tolerable at the individual level can degrade the planets life support systems if thousands or millions of people do them. One person fertilizing their lawn near Chesapeake Bay for example makes no significant impact, but when thousands do it the bay becomes degraded and Blue Crab populations decline precipitously

When it comes to chemicals the current regulatory approach to controlling pollution does not deal with global pollution. The main focus has instead been on the maximally exposed individual.[1] In the United States, we conduct risk assessments (used when conducting "cost-benefit" analyses) to evaluate the risk to a hypothetical "maximally exposed" individual. If the threat to that individual (or honey bee) is found to fall within acceptable limits, then regulation does not occur and these so-called acceptable amounts of contamination are allowed to be released forever after Then another risk assessment and cost benefit analysis gives the go-ahead to another acceptable release or use of a different toxic substance or harmful activity. Then another and another What we have not started to look at until recently is the total impact of all these acceptable risks. Our society has assumed that it could tolerate unlimited small amounts of harm as a byproduct of economic growth. It is only when a particular activity is demonstrated to fail to provide a net benefit to society that most of our property and environmental laws are permitted to interfere with economic activity

Obsolete Laws

Biochemist and lawyer, Joseph H. Guth, legal director of the Science and Environmental Health Network, has analyzed this situation and offered solutions in several scholarly papers one of which is soon to be published in the *Barry Law Review,* titled "Cumulative Impacts: Death-Knell for Cost-Benefit Analysis In Environmental Decisions."[2] In this paper Guth points out that our laws only forbid damage when the perceived benefits are not considered to outweigh the cost or destruction to the environment or human health. The law also puts the burden of proof that an activity is creating more harm than good on the injured party, or the government. If the victim (or the government) can not meet the burden of proof, then the damaging action is allowed to continue by default. This burden of proof transforms doubt, and missing scientific information into a barrier to legal protection for the environment (and honey bees). The default presumption is that the benefits of economic activity always outweigh the costs unless a specific cost-benefit analysis (often based upon incomplete or faulty research conducted by those that stand to profit) can show otherwise.

According to Joe Guth, " we see the fatal flaw inherent in our system of environmental decision-making. Routinely allowing all environmental impacts except those proved to fail a cost-benefit test, it permits those impacts to grow without limit even when their cumulative effect results in ecological overshoot. Many of these impacts occur not because they actually satisfy the law's cost-benefit test but because whenever we do not know enough, the law's default structure permits them to continue."

Joe Guth continues: "These laws do not permit regulators broadly to take account of what is happening to the world around them. They embed regulators in a decision-making structure that may seem scientific but in fact is profoundly unscientific because it prevents them from responding to the ever more detailed findings by the world scientific community that we are overshooting the Earth's ecological capacities. Rooted in the assumption that ecological overshoot does not occur, our current statutes are incapable of containing the cumulative scale of ecological damage It is an approach that has become outdated because it is based on assumptions that are no longer valid."

Guth sums up by stating, "To maintain a functioning biosphere in which humans can prosper, the law must turn its attention to the problem of cumulative impacts. The law will have to abandon its use of cost-benefit analysis to justify individual environmental impacts and instead adopt the goal of maintaining the functioning ecological systems that we are so dependent upon."

From "Yes We Can." to "Now We Do"

In Section II of his "Cumulative Impacts" paper, Joe Guth states that "Our legal system already harbors examples of decision-making structures that establish a principle of standard of environmental quality or human health and do not rely on cost-benefit

"An approach that should be considered in combination with the Precautionary Principle is to make chemical manufacturers responsible for the impacts that their products have on the environment."

balancing." and that these examples "show that such legal principles or standards can enable the legal system to contain the growth of cumulative impacts." Clearly we have the capacity to deal with this issue if we decide we really want to.

These new understandings of chemical toxicity and our inability so far to adequately address them with our current regulatory structures and laws may help bring about radical and overdue changes to our chemical regulating policies. Other countries are starting to come to the conclusion that broad screening principles should be applied before individual chemicals are even tested. Such thinking would require us to go beyond the European Union's new chemicals policies. The Swedish Natural Step principles might be a good place to start in establishing a truly adequate and protective chemical policy [3] The Natural Step Framework of four system conditions that focus on ending the systematic buildup of toxic substances, the degradation of nature and our natural systems, and conditions that undermine human needs, has proven itself to be a scientifically robust model that can be used to help us make pragmatic decisions that move us toward sustainability

Another way in which we might move toward a system that allows us to enjoy the fruits of modern technology while honoring the limits of the Earth is by making a serious commitment to adopt the Precautionary Principle.[4] This principle would shift the burden of proof by assuming that every action that causes an impact on Earth may be harmful unless proven otherwise, and by forcing us to always seek out and choose the least harmful alternative. Furthermore the Precautionary Principle requires that we pay attention to the consequences of our decisions by monitoring for environmental harm and reversing course if necessary This would also mean that we would favor decisions, or courses of action that are reversible and avoid commitments that are extremely difficult to undo[5] (such as releasing genetically engineered organisms into the environment).

An approach that should be considered in combination with the Precautionary Principle is to make chemical manufacturers responsible for the impacts that their products have on the environment. We currently allow companies to externalize these expenses. Often it is we, the tax payers, that are having to cover the costs of cleaning up messes like the superfund sites scattered throughout the U.S. Unfortunately, of the more than 1700 superfund sites that have been identified in the U.S., less than 500 have been cleaned up since the fund's establishment in 1980. We need to start forcing companies to bear the costs of cleaning up the messes their products produce.

These may seem like common sense proposals, but how remote they are from the way decisions are being made today! The importance for human society to approach chemical regulation (and many other issues) differently becomes apparent the moment we accept that humans have become a force of geologic proportions and are degrading the biosphere upon which the honey bee (and ultimately all other species) are entirely dependent. This implies that the public along with the media, the courts, public and corporate decision makers, and school children, among others, must be informed that the world is new – new because humans have become a force of geologic proportions and are now degrading the planet in ways that threaten the ability for much of the life that exists now to continue to survive. This is definitely new and requires a new understanding of our history and our kind, new thinking, new goals, new habits and attitudes, new stories and societal structures. Much of what we learned in high school and college is obsolete and stands in our way

In taking on these efforts we must give full recognition to the remarkable human capacity for self-deception and denial. We humans do not accommodate change readily, in fact we tend to resist it. We seem wired (especially as we age) to deceive ourselves and deny reality; we look for scapegoats to blame and punish. This crucial reality must be thoughtfully acknowledged and navigated successfully if we are going to manage to implement the changes that are needed.

Time is of the essence

Proper chemical regulation is not primarily a technical problem but a human problem that encompasses money, political power, and societal rules and laws based upon faulty assumptions. These issues will need to be overcome before we can expect CCD to totally go away Given that it is not just honey bees that are in decline but also native solitary bees, moths, butterflies, bats, and birds, this problem is all the more urgent. Researchers that study these things indicate that we are currently seeing a rate of species extinction of about 70 species a day, that's about three species an hour (some estimates are much higher). This is a rate the planet has not seen in about 65 million years, a time when an giant asteroid is believed to have collided with the Earth and the dinosaurs died out.[6] At this rate, some estimate that about half of all the life forms living on earth today will not exist by 2100.

Given all that we don't know or understand about the effects the chemicals we are making and using on a daily basis are having on the world, it is hard to imagine that they are not playing a significant role in the current rates of species extinction being observed today A role that may be on par with the disappearance of our forests, the acidification and warming of our oceans, and the increase in carbon dioxide concentration in our atmosphere. Our future, which is intimately tied to the Earth's future, depends on what we choose to do on personal, regional, national, and international levels as a society One place we can start today is by reducing or eliminating the use of

chemicals in our hives. Then we can expand on this to reduce or eliminate chemical use as much as possible from the rest of our lives. If we don't take effective action to come to grips with this entrenched problem soon, we may find that CCD is just a harbinger of things to come. BC

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ASSASSIN

She was fat, and plump and an egg laying machine!

Eugene Makovec

I've always been kind of a live-and-let-live beekeeper

I don't mean to say I'm neglectful. To the contrary, I've probably inhibited honey production by bothering my poor bees too much – they're just so darned interesting!

I have taken steps to head off pests and disease, and to keep colonies from starving. But while I've played Robin Hood in the Spring with honey stores and, to some degree, colony populations, I have not been one to actively cull weak hives from the yard. So I was a full ten years into this hobby before I did what had once been unthinkable – I killed a queen. On purpose.

Oh, it wasn't the first time I'd been responsible for the untimely death of a queen bee. I'd accidentally killed at least one, and there had been several over the years whose disappearances had been suspicious, with Yours Truly the primary suspect.

But this was the first time I had purposely rubbed out royalty And the fact that it was intentional didn't make me feel any better about it.

She was only a year old, and a prolific egg-layer, a wonder of nature. I'd bought her with a nuc the previous Spring, and she'd headed the strongest of my four hives. (Okay, that's not saying much, but this hive produced about 150 pounds of honey that year.)

So clearly, production was not the problem. Rather, her demise could be attributed to a personality conflict.

It's rather like having a star employee, one who excels at every task she undertakes, who outperforms everyone in her department, but who just can't get along with the boss. She reacts to every interaction, no matter how positive, by lashing out. She can't even accept a compliment, much less constructive criticism.

Of course, in the case of bees, it's not the queen but her workers who exhibit said irritability Whereas I normally have to work to get a colony riled up, I couldn't pop the lid on this hive without them letting me know I wasn't welcome.

This antisocial behavior started

late that first Spring, after they'd ramped up in population and were storing honey like nobody's business. I know it's customary to requeen such "hot" colonies, but it's not easy for a guy like me to buy just one queen, especially in the Spring. Besides, I couldn't see interrupting such a productive colony with the loss of a full brood cycle that such a replacement would entail. So after a few unpleasant encounters, I found it easiest to just leave them alone; I was happy to remove honey supers (thank Heaven for clearing boards), but going downstairs for a detailed inspection wasn't worth the aggravation.

I checked for mites in the Fall (taking a couple of stings in the process) and wished them good riddance for the Winter Come Spring, I had a plan to get even. I'd make a split from another colony, let them raise their own queen and, once she'd begun laying, pull the "African Queen" and make a seamless replacement, probably in early to mid April.

But all that changed in February On the first of the month, I took advantage of a warm spell to go by and check stores on all four hives. I lifted one end of each hive to gauge weight, then raised the cover to check the size and location of the cluster Of the four, this was the only one that greeted me with a contingent of stormtroopers, fully armed and with weapons drawn. I gotta do something, I thought.

Judging by the weight of the hive, these bees were also on the brink of starvation, so I came back the next day for what could almost be described as a drive-by feeding. I'd swung by Shop 'n Save for a sale on cane sugar, and decided to give them a little in granulated form on the way home. When I opened the hive, the inner cover came off with the outer lid, and most of the bees on the tops of the frames went straight for me. I dumped about a pound of sugar right on the frames, then another pound on the inner cover I replaced the lid and got the heck out of there.

Three weeks later I returned to

begin implementation of my split plan. As I fought my way through this colony I noted some early brood buildup, not as impressive as a couple of the others, but promising nonetheless.

And then I saw her She was large and plump, a beautiful specimen. I hesitated. Would I spot her so easily come April? Finding queens had never been my forte, and six weeks from now, with the colony much more populous and mean as the devil, I might not want to spend the time searching for her Plus, if her brood production was anything like the previous year, I might just change my mind and choose honey over harmony again. In which case, I'd be kicking myself come Fall.

And so, with uncharacteristic decisiveness, I acted.

As I zeroed in on the villainous vamp, she seemed to sense what I had in mind. She moved hastily across the frame, but just as she reached the wooden edge, I flicked her off with my hive tool. She landed awkwardly on the pallet, and I stepped on her It was all over but the second-guessing.

Why had I been so impatient? Couldn't I have just waited a few weeks for my well-hatched plan to play out? Had I just cost myself a hive's worth of honey production?

Fast-forward to April 15. I now had a laying queen (started from a frame of eggs and larvae from another hive) and two-and-a-half frames of sealed worker brood. They were not as populous as they would have been under my original plan, but were further along than package bees and roughly equivalent to the nuc they had been a year earlier

More importantly I could look through this hive now without feeling like an eight-point buck on opening day of deer season.

I've always heard that the simple act of replacing the queen can quickly turn a nasty colony into a more even-tempered one, even though the existing workers are all offspring of the old queen. Call me a believer

Which brings us back to the analogy of the star employee. If you've ever managed people, you've probably had someone who fit that earlier description. At some point, you figured out that whatever positives she brought to the job weren't worth the headaches she caused, and the moment you replaced her the morale of everyone around her improved noticeably

You may even have discovered afterward that she hadn't been as irreplaceable as you'd thought. The solution had been there all along; you'd just been afraid to act. BC

Keep Cool!

Ann Harman

Hot weather can be dangerous. Don't get caught.

The weather forecast is for sun, high of 96°F, and you are planning to spend part of today in your beeyard. It's going to be HOT! Just when do you expect to be in the apiary? How do you plan to keep yourself from collapsing while working? News reports always warn about the dangers of heat exhaustion and heat stroke. Are you the next one in the news?

If you spend much of your days in an air-conditioned environment, you are not very well acclimated to working in hot conditions. Therefore, you must be very careful about your exposure to heat and humidity

Here is a short review of heat problems that you could encounter All these are preventable with some planning on your part. All these can be alleviated provided you pay attention to early signs.

(1) **Heat Cramps**. Painful, strong muscle cramps in muscles at the back of calves. Connected to heat, dehydration and poor conditioning.

What to Do? Get out of the heat into a cool environment. Drink water Rest.

(2) **Heat Exhaustion**. Signs include paleness, dizziness, nausea, vomiting, fainting, and a temperature about 101-102°F Caused by excessive heat and dehydration.

What to Do? Get out of the heat into a cool environment. Use ice packs. Drink water Rest. If unable to drink, IV fluids may be necessary

(3) **Heat Stroke**. Severe! Signs are warm, flushed skin, with *no sweating*. Very high temperature, about 106°F or higher Person may be unconscious, delirious, or having seizures.

What to Do? Hospitalize immediately Ice packs, IV fluids. Consider this a true emergency situation.

If it is necessary to take a person's temperature, only use an oral or rectal thermometer The fancy ear or forehead temperature indicators are not suitable.

In northern New England and mountain areas of the United States heat may not be a problem. But for a large part of the country Summer means heat and frequently its companion, humidity. The weather bureau has combined these two and reports the Heat Index during Summer months. These are the numbers that are important. If you live in the humid heat part of the country you should pay attention to weather reports and particularly the Heat Index for the day you are going to the beeyard. High humidity means your body has trouble evaporating sweat to keep you cool. However, if you live in a hot dry climate you may dehydrate rapidly and not notice it.

Now it is time to go to the beeyard. The beekeeping books that contain beeyard design frequently describe ideal conditions for the hives. Those conditions are ideal for you, the beekeeper, too. I'll bet you didn't give a thought to hive work in your beeyard design. Morning sun is recommended because it gets the bees moving. Afternoon shade helps the bees keep hive temperatures stable. Not every beekeeper can achieve this plan, however, so hives may have sun all day

This year you can spend some time throughout the day during the hot months mapping the path of the sun and approximate times of sunrise and sunset. This sunshine project is for your comfort in the beeyard.

If possible try to use the morning hours, say before about 10:30 AM. During the Summer the sun is up early and bees are flying but the heat has not built up. For those who cannot make use of morning hours, wait until late afternoon as the sun is starting to be lower in the sky You know when your hives are in the shade, so use that time for inspections.

It is only a bit of surprise to find out what beekeepers drink in the beeyard. Some beekeepers seem to give keeping themselves hydrated little thought. Many beekeepers indicated that they did drink water Some beekeepers added a cold beer to their water consumption.

Water is the essential drink for hot weather Sports drinks, such as Gatorade®, can be used also, but in moderation. Sweat is water Only very small quantities of salt are in sweat, so water is the best replacement for sweat. Do not wait until you feel thirsty, especially in hot dry weather Drink water before you go to the beeyard; drink lots of water while working; drink some more after you stop. If you forgot to take a jug of water to the beeyard, go back home and get it. Water is the key to preventing the problems that heat can cause.

Clothing needs to be considered. Cotton is a good fabric for hot weather It absorbs sweat and as it evaporates from the cloth, a cooling effect takes place. Many synthetics leave you feeling hot and sticky However some new fabrics exist that are cool to wear Clothing should be loose-fitting so that air can circulate under the clothing. T-shirts frequently fit tightly but since they allow easy movement they are popular If you wish to wear t-shirts, have some that are a bit too big for that loose fit. Many experienced beekeepers wear short-sleeved shirts and shorts. I do. The bees do not get trapped in shorts as they do in long pants. Shorts are cooler than long pants, too.

Many new beekeepers have that fear of being stung and wish to wear coveralls, bee suits. Some wish to wear bee suits to keep clothes clean. Well, you can have some old shirts and pants or shorts that can get full of wax, propolis and general beehive dirt. Those will go through the washing machine as well as a bee suit. When they get really grungy, turn them into rags and pay a visit to the thrift store for a new supply

But if you feel you need a bee suit, make sure it is a loose fit and that the fabric has a high proportion of cotton or is all cotton. When you are closed up in a bee suit air does not circulate very well so you may find yourself getting uncomfortably hot. When this happens, walk outside your beeyard and open up the bee suit or take it off for a while. Drink some water and cool down before suiting up and going back to your hives.

A few other techniques work quite well. Is there a creek near your beeyard? Jump in it and splash cool water over yourself from time to time. Perhaps there is a nearby garden hose. Just soak yourself and enjoy the coolness. Take two jugs of water to the beeyard – one to drink and one to pour over you. The bees really do not mind that you are soaking wet.

Since I spend much time outside, except in really dangerously hot weather, I have discovered a wonderful, comfortable way to keep cool. I wear cooling clothes – and they keep me cool for hours. Here is the website: www.coolmedics.com.

When you open this site you will see a number of sites for these cooling clothes. They really work. They will keep you cool for hours. The websites explain how the special fabrics and construction works,

I wear the cooling clothes when I am beekeeping, riding my horse, gardening and working outside on projects around the farm. I have the cooling cap that fits under my bee veil or riding helmet or sun hat. I have the cooling scarf that I use for not-too-hot days or for short-time work. And I have the cooling vest with standup collar for bee work and horse riding. I appreciate every minute I am wearing these in hot weather All are very comfortable to wear

You soak the apparel in a bucket of water for a short time, as directed in the instructions. Give a squeeze to get rid of excess water, and put on. Immediate "ahhhhh – cool" even on the hottest of days. You can wear these under bee suits or other clothing if you wish.

I have recommended this cooling clothing to some beekeepers, including a queen producer, and all report great satisfaction. The vests may seem expensive but with reasonable care they last for years. Besides, it's cheap insurance against heat exhaustion or heat stroke. You still need to keep yourself hydrated so drink plenty of water

Here are some photos to give you a quick preview of the websites. Go ahead – get cool! BC

Ann Harman keeps cool while tending her bees, horses, and other critters at her home in Flint Hill, Virginia.

Heat Index Chart

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

For more information on how to deal with extreme heat indexes visit http://www.nws.noaa.gov/om/heat/index.shtml

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

The author in her cool vest and hat. For information on these items visit www.coolmedics.

GLEANINGS

AUGUST, 2009 • ALL THE NEWS THAT FITS

HONEY STANDARD MADE LAW

Florida Agriculture and Consumer Services Commissioner Charles H. Bronson announced that his department has instituted the first regulation in the nation – and perhaps the world – prohibiting any additives, chemicals or adulterants in honey that is produced, processed or sold in Florida. The regulation, which takes effect July 14, provides the first-ever "Standard of Identity" for honey.

"We want to assure consumers that the product that they are buying is pure," Bronson said. "Too often in the past, honey has been cut with water or sugar, and sometimes even contaminated with insecticides or antibiotics. In the future, when you're paying for honey in this state, pure honey is what you will get."

State Rep. Alan Hays, of Umatilla, has been a major advocate of the new regulation, which is supported by Florida's honey industry, and joined Bronson at a press conference here today to unveil the new rule.

"I am pleased that the Florida Department of Agriculture and Consumer Services is leading the way for all America in establishing this standard by which all honey may now be measured," Hays said. "Commissioner Bronson and the leaders of the honey industry – beekeepers and honey processors – are to be applauded for their leadership in protecting not only the health of Floridians but also in protecting this industry which is so vital to the production of food products for all mankind."

Under terms of the new regulation, honey containing anything other than the "natural food product resulting from the harvest of nectar by honey bees" is considered an adulterated or mislabeled product. Such products are subject to a "stop sale" order in which a manufacturer, processor or merchant would be served with an order prohibiting the product's sale. Repeat offenders would face fines of up to $500 per violation.

Florida is the fourth-leading honey producing state in the country with cash receipts to beekeepers of more than $15 million in 2008 and an industry that has an economic impact estimated at $40 million a year. It employs more than 500 Floridians.

As a result of a flood of adulterated honey from overseas into Florida in 2006, a petition was submitted to the U.S. Food and Drug Administration (FDA) later that year by five major honey producers and processors, asking the federal agency to establish a U.S. standard of identity for honey. Two years later, the FDA responded that due to other pressing matters, it would be unable to review the petition.

At that point, the industry asked Bronson's department if it would consider developing a standard of identity for the product, and today's announcement is the culmination of that effort.

Bronson noted that despite efforts in various quarters, international governing bodies have to date been unable to establish an international definition of or standard of identity for honey, making it likely that Florida's regulation governing honey may be the first of its kind anywhere.

Get Well Wishes From All Of Us

Bob Cox, a Category III Scientist at the Kika de la Garza Subtropical Agricultural Research Center in Weslaco, TX, has been undergoing treatments for brain cancer that was discoveed in December. He has had chemotherapy and some surgery. The next part of hs journey will be radiation treatments at the M.D. Anderson Hospital in Houston. His treatments there will keep him away from home for the next six to eight weeks. Sometimes just a note or a card can do wonders. Send to Bob Cox, 914 Kerria Street, Weslaco, TX 78596.

Sweet & Sour
HONEY AND VENOM HELP ARTHRITIS

A New Zealand company is seeking approval in the United Kingdom to market the venom from honey bees as a novel food ingredient.

A novel food is a food or food ingredient that does not have a significant history of consumption within the European Union before 1997

The UK Food Standards Agency says the venom is extracted from *Apis mellifera* using a milking apparatus procedure. The venom is then dried and added to honey.

The company, Nelson Honey and Marketing (New Zealand) Ltd., states the venom may help to alleviate symptoms of arthritis.

Honey containing venom has been on the New Zealand market since 1996, but it is considered novel in the EU.

Before any new food product can be introduced on the European market it must be rigorously assessed for safety. In the UK, the assessment of novel foods is carried out by an independent committee of scientists appointed by the Food Standards Agency, the Advisory Committee on Novel Foods and Processes.

OBITUARY

R. Waldo McBurney passed away July 8th, 2009. Proceeded in death by his first wife Irene, daughter Mary Jane Boyle, a grandchild, a great grandchild, four brothers & a sister.

Not only was McBurney a lifelong beekeeper which shared his wisdom with me but also a friend.

He was born on the Kansas high plains in the small settlement of Quinter, Kansas in a sod house on October 3, 1902. If he had lived another three months he would have been 107 years old.

McBurney wrote a single book about his life, *My First 100 Years.* The way McBurney was staying physically fit many of us believed he might make the 200 year mark! If you Google his name you can see a picture of McBurney fast walking at the young age of 105 on the main street of Quinter, Kansas.

He graduated from KS State University in 1927. Highly unusual for a college educated man in 1927 to seek out the simple life of a sideline beekeeper. McBurney always preferred the simple life of taking care of his 100 hives and his large garden. McBurney walked a mile each day to his small honey sales shop and then back again at night. The last time we talked McBurney still had a valid Kansas Drivers license.

In September 2004 *Bee Culture* magazine published an article I wrote on McBurney. I did the article after interviewing him at the spring meeting of the Kansas Honey Producers. He and his wife Vernice were regulars at the KHPA meetings.

I asked him once when he was going to retire and McBurney answered "When I go out there!" pointing to the graveyard. He did not fear death he told me but admitted it was hard to watch all his family and friends pass away.

McBurney was very health conscious and stayed physically fit. Even at over 100 he helped with the bees. A Quinter local resident named Delbert Swihart did the heavy work. I still see and talk to Delbert at KHPA meetings and Delbert kept me informed as to what was going on with his friend.

USA Today did an article on McBurney a few years ago. He was active in the senior Olympics in the 100 year old class. A few of his records still stand. Last year he was given the title of the oldest worker in the U.S.

He always had a smile on his face and kind words for all he met. His daughter Ruth Mann said about her father in his book: "You seem always the same age, never growing older"

Bob Harrison

LAWRENCE ROBERT GOLTZ, 1922-2009

Retired *Gleanings In Bee Culture* Editor Dies At Age 87

Lawrence Robert Goltz, naturalist, photographer and author and Editor died April 19, 2009 at his home in Redding, California of natural causes.

Larry was editor of *Gleanings in Bee Culture* from 1975 – 1983 and served as *Gleanings* Western Editor for an additional year after that before he retired completely In addition to his editorial duties, he wrote extensively on apicultural issues including a series of articles on honey plants that became classics in the field and were translated into several languages. His articles became books and his books became classics, too. His other writings covered the sticky subject of honey marketing, aimed at hobby and sideline beekeepers. As a science journalist, Goltz found photography a natural extension of his writing which continued to be a passion of his after retirement.

Larry was active in Boy Scouts and other volunteer work both in beekeeping and other topics while living in Medina. During his tenure as Editor he worked with Roger Morse, Charlie Koover P.F Thurber, Richard Taylor and Charles Mraz. Larry was Editor during the Golden days of the late 70s, when the back to earth flower children flocked to beekeeping like ducks to water He presided over huge circulation gains during that time when anything and everything beekeeping was on everybody's list of things to do. The trend didn't last, but Larry rode it out and enjoyed every minute of it.

After moving to California he continued his beekeeping hobby running several colonies in various locations around the area. He produced Star Thistle and Strawberry honey and of course local wildflower flavors, and sold out every season at the Redding Farmer's Market. He wrote articles for the magazine on a variety of topics, mostly looking at the world and the beekeeping world, and how he saw that interaction. He also made many sage observations in his frequent letters to the Editor over the years. He was gracious in his praise for the magazine and was pleased to make contributions.

Since retiring in 1984, he was an active volunteer in and around Redding. He served in the Nature Interpretation Section of the National Park Service at the Whiskeytown Shasta Trinity Recreation Area. Having training in the natural sciences, particularly Botany, he concentrated on wildflowers and his favorite park service assignment was to lead visitors on wildflower hikes. He wrote extensively on the subject of Western wildflowers which was also the subject of his teaching at Shasta Community College. Larry was a docent at Turtle Bay and served as an adviser at the Redding Arboretum for several years.

Following his photography passion, his photos won awards and have been exhibited at the Redding Public Library, Turtle Bay, and the Bank of America. His subjects included forests, ocean, mountains, rural landscapes and, of course, his favorite subject, wildflowers of the Western United States. Goltz sold photographs at arts and crafts fairs around northern California and Oregon. He had just completed and hoped to publish an autobiographical book entitled "Travels with Camera", and was ready to publish another book, this on social commentary entitled "New World Order "

He was a veteran of World War II and was involved in several well known military campaigns of that war including the Battle of the Bulge and the Normandy Invasion. Edna Eugenia Goltz, his wife of 56 years passed away in March 2001 His funeral was held at Allen and Dahl Mortuary in Redding on May 1 and he was buried at Eagle Point National Cemetery in southern Oregon on May 6. Larry Goltz, Editor, Naturalist, Photographer, author and father is survived by a son, James of South Pasadena, California, and two grandchildren.

BRUSHY MOUNTAIN WINS RECOGNITION

Steve Forrest (left), president of Brushy Mountain Bee Farm in Moravian Falls, accepts the $1 Billion Award for NC from Steve Laton, lean product leader for NC State's Industrial Extension Service.

Steve and Sandy Forrest, owners of Brushy Mountain Bee Farm, point to example after example of how their business is not only surviving, but thriving, in these lean times and to the phenomenal growth they've experienced in the past two years. That success is the result of applying lean manufacturing techniques they learned from a specialist with North Carolina State University's Industrial Extension Service (IES) – invaluable training that didn't cost the Forrests a dime.

On June 3, 2009, representatives from IES presented Steve Forrest with the $1 Billion Award for North Carolina, formally recognizing Brushy Mountain Bee Farm for posting more than $2 million in increased sales and for increasing its workforce from 27 to 50 employees.

"The government never did anything to help me that I can put a finger on until this," Forrest said at the awards ceremony. "This program is the only thing I know of trying to help American business, and small business generates jobs. This is one of the biggest opportunities I've had to positively impact the lives of people here in North Carolina."

Forrest said in addition to almost doubling the number of employees at his business, he has also been able to provide benefits such as a 401(k) plan and health insurance. "I can't even guess the amount of money that has gone into the local economy," he said.

"We got money from the federal government to pay for this," Forrest continued. This is the first time I've gotten money *from* the government."

As he accepted the award, Forrest said, "This is not a day of celebration for Brushy Mountain Bee Farm, but a day of celebration and promotion for NC State Industrial Extension Service. I'm so impressed with what they do, I've joined the board. We need to get the word out about what NC State does."

Steve Laton, lean product leader for IES, congratulated Forrest and said, "Brushy Mountain Bee Farm stands out as a special case in this economy."

In business since 1977, Brushy Mountain Bee Farm manufactures and sells a variety of beekeeping supplies, beeswax for candle and soap making and educational books and videos.

Lean principles are focused on increasing productivity and decreasing waste, and incorporating those principles at the business led to expansion of the wood storage area, the woodenware assembly area where the beehives are constructed and the packaging area where personnel prepare an average of 300 orders per day for shipping.

"The woodenware assembly area is a great example of us taking what we learned in the green process and making ourselves much more efficient," said General Manager Shane Gebauer.

In a clean, well-ventilated and light-filled workroom, woodworkers assemble the various components of the firm's beehives. The redesign of the workstations, the equipment setup and doubling the number of workstations have resulted in significant decreases in the production cost per piece and in assembly time. For some pieces, Gebauer said, the production cost dropped by half.

By improving its production processes, Brushy Mountain Bee Farm has been able to take full advantage of the increased popularity of beekeeping.

To better serve walk-in customers, Brushy Mountain Bee Farm has a brand-new retail building which opened in July. The recently completed building will provide enough room for the onsite retail operation to display more products and expand offerings to include bee-related gift items as well as the standard beekeeping equipment and supplies.

And as if all these expansions and improvements aren't enough, the company plans to open a distribution facility in Pennsylvania this fall to serve the growing number of customers in the Northeast.

To learn more about Brushy Mountain Bee Farm, click to www.brushymountainbeefarm.com.

NORTHEAST SARE DEADLINES

Sustainable Community Grants November 24, 2009 – We will release the application in early August, and in the meantime you are encouraged to look at brief descriptions of recent community grants. These awards are for community groups working with farmers to advance economic development.

Partnership Grants December 1, 2009 – We will release the application in early August and in the meantime you are encouraged to look at brief descriptions of recent partnership grants. These awards are for agricultural service providers who work directly with farmers.

Farmer Grants - December 8, 2009 – We will release the application in early August, and in the meantime you are welcome to download and read "How to Write a SARE Farmer Grant." You can also read brief descriptions of last year's awards.

For information on all of these grants please visit the SARE website at nesare.org.

Send Your Meetings Notices to

Kim@BeeCulture.com

and we'll get it posted for the whole world to see

Visit - http://my.calendars.net/bee_culture

OBITUARY

James Irvin Powers (Jim) died at his winter home in Sun City, Arizona on April 24, 2009 at the age of 81. He was born in Emmett, Idaho on November 28,1927.

Jim grew up in Parma, Idaho and graduated from the Parma schools in 1945. His Grandfather, Francis Powers, homesteaded in the Ten Davis area near Parma and started Powers Apiaries, a company specializing in the production of honey. His father, Irvin Francis Powers, continued the business and became known as a pioneer in modern beekeeping practices.

After High School Jim joined the Army and served with the Army of Occupation in Japan. After his discharge he attended the University of Idaho. When he graduated he joined the Air Force as a 2nd Lieutenant during the Korean War. When his enlistment was over he took the Foreign Service exam and became a Foreign Service Officer. When he retired he was serving as Vice Consul in El Salvador.

In 1959 he returned to the family business further expanding Powers Apiaries into six states. He served there until retirement. He retired as President of Powers Apiaries. Jim also attended Harvard Business School in their Smaller Company Management Program. He was very active in national beekeeping organizations as well as civic organizations in Parma. He received several awards including the Bruce Mitchell Award, the Melvin Jones Award for the Lions Club, the Tom Takitori Award as Volunteer of the Year, and the American Beekeeping Federation's Presidents Award.

Jim was an active member of the Lions Club and the Kappa Sigma Fraternity.

He was preceded in death by his Mother, Neva Cayford Powers and his father, Irvin Francis Powers.

He is survived by his wife, Judith Morgan Powers and four children; Judith Lake Puett Davis (Rod Davis), Barry Faye Puett (Robert Tisdale), Julia Morgan Puett, and Garnett George Puett III (Whendi Grad). He is also survived by six grandchildren; Rose Grad Puett, Garnett Karl Meise, Lin Morgan Meise, Garnett George Puett IV, Barry Powers Puett, and Grey Rabbit Puett.

He was also preceded in death by his beloved dog Vince.

CALENDAR

♦INTERNATIONAL♦

The National Honey Show will be held October 29-31 at St. Geoges College, Weybridge, England.

Featured speakers include Jennifer Berry of the University of Georgia, and Dr. James E. Tew of Ohio State University.

For information and updates contact hfcapener@tiscali.co.uk.

Apimondia 2009 September 15-20 in Montpellier, France. For registration and information visit www.apimondia2009.com.

♦ALABAMA♦

The Alabama Beekeepers Association will hold their annual meeting October 9-10 in Montgomery at the Taylor Road Baptist Church.

Featured speakers include Jennifer Berry of the University of Georgia, Dr. James E. Tew of Ohio State University, and G.W. Hayes, Jr. of *The Classroom (American Bee Journal)* and the Florida Department of Agriculture & Consumer Services.

Check www.alabamabeekeepers.com for registration and additional information.

♦CALIFORNIA♦

The 31st Annual Conference of the Western Apicultural Society (WAS) will be held August 17-20 in Healdsburg, in the heart of Wine Country. The main conference will be at the Dry Creek Inn and Krug Event Center, 198 Dry Creek Road, Healdsburg.

Topics include honey bee health and disease research, biology and management of honey bees, impact of native bees on commercial crop production and much more.

For information contact Eric Mussen, ecmussen@ucdavis.edu or visit www.groups.ucanr.org/WAS/

♦CONNECTICUT♦

Backyard Beekeepers Association will have their queen rearing yard open most Sundays from 11:00 a.m. to 3:00 p.m. Each month time they have timely inspection workshops, mentor programs and more. All events are free and open to the public. Visit www.backyardbeekeepers.com or contact Serge Boyce, 203.259.4861, sergeboy@optonline.net.

August 1 Fall Preparation, David Blocher; September 12 Hive Inspection, Andrea & Bahman Azarm; November 7 Beeswax Workshop, Ellen Zampino & Patty Pulliam.

♦MASSACHUSETTS♦

Northeast Treatment Free Beekeeping Conference Doyle Convention Center, Leomunster, July 31- Aug 2. Visit http://beeuntoothers.com/conference.html.

♦MICHIGAN♦

Michigan Beekeepers will hold their Fall meeting October 23-25 at the Valley Plaza Resort, 5221 Bay City Road, Midland.

Larry Connor will be the main speaker on wintering bees and making Michigan Queen Bees. Q&A will follow. Other classes on creamed honey, insurance, mead making, bees in the city and more will be offered both days.

There will be a banquet Friday night and election of officers on Saturday afternoon. Call the Resort for room and banquet reservations, 800.825.2700.

For information and to register contact Jim Dodder, 810.653.8547.

♦MONTANA♦

The Montana State Beekeepers Association will hold their annual state convention October 15-16 in Missoula Montana.

For more informaiton contact President Nicole Ulibarri 206.579.0192.

♦NEW YORK♦

EAS 2009 will be held at Holiday Valley Resort in Ellicottville, August 3-7, 2009.

Mark your calendars now and watch for details. Visit www.easternapiculture.org.

♦OHIO♦

First Annual Instrumental Insemination Course will be held September 9-11 taught by Dr. Joseph Latshaw. Course size will be limited to allow for individualized instruction.

The cost is $780/person – $480 Course registration and three days of instruction, $300 Room and board for four nights and all meals.

Please visit www.latshawapiaries.com for additional details and application. Call or email Joe at ohioqb@aol.com, 614.855.9065.

♦VERMONT♦

Bennington County Beekeepers Club Limited will hold their meeting August 20 at the Vermont Veterans Home, in the Crispe Room.

Lloyd Spear from Ross Rounds will be the guest speaker.

For more information contact Jacob Esh 802.447.0198, cbook@pngusa.net.

National Honey Bee Awareness Day

This first annual event, dedicated to our favorite pollinator, is a grassroots effort by beekeepers and beekeeping associations to raise the awareness and appreciation of the value and plight of the honey bee. Each individual or group can plan a public event for this day, and create a wonderful national energy towards helping honey bees.

Bee inventive and inspired, and join in the support.

Visit www.nhbad.com for ideas & information

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They simply wear out and break down. The un-ceremonial way they are treated after a life of giving seems a bit tragic to us, but to a bee it's the way it is. Go until you can't.

But when a whole colony suddenly dies, eaten in the night by creatures unseen, because their keepers didn't use the equivalent of electric fences, leg traps, live traps, or fear and intimidation in time, on time or at all a whole living force goes missing, an entire community is gone. The loss is magnified when you realize it could have been prevented by you.

One reaction is to wander across the road and talk to the guy who knows how to get rid of those things that munch on your bees in the night. He uses well, do you want to know what he uses? Is it better to not ask what it is if you use it too, as long as it puts up that infallible fatal fence?

The point here is that keeping your colony healthy is a constant, ongoing, never-ending responsibility You start the day the package goes in and you never, ever quit. Like being a parent

If you do that keep a close and constant watch and do the best practices things you need to do, you and your bees should never get to the point where you have to find a solution that's an unknown, unsafe, or illegal choice.

But if you do, if you find out the monsters are ahead and it's the bottom of the ninth use the legal choices, the safe and sane and harmless-to-your bees choices. Use the traps and the screens, the dust and essentials. My tomatoes didn't suffer when the rabbits went away, and they didn't suffer after they were gone. Your bees shouldn't suffer when varroa goes away And they shouldn't suffer after they are gone either

So check out your bees and see if they and *Varroa* are getting along, or are *Varroa* getting ahead. If needed, do the right thing, if not, relax, but not too much, or for too long.

And now it's time to gear up for Winter even though it's hot out there. So get busy and remember to keep your veil tight, your smoker lit, and your hive tool sharp. You'll do just fine.

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Yesterday evening I stopped by Butch's to pick up a little swarm on a cottonwood tree in his yard. He and Sharon were hosting a garden party when I arrived, so I knew that there was no way I was going to get to do this without an audience. As soon as I donned my veil and put up the orchard ladder, people started streaming off the deck to watch.

This was the tiniest of honey bee swarms – a softball-sized little clump of bees clinging to each other and to a single cottonwood leaf on the end of a new shoot. I reached up, clipped off the end of the shoot, and *Voila*! They hung like a bunch of grapes from a stem between my fingers.

This was a crowd pleaser, and when I got down off the ladder, people pressed close. This is the thing I don't like about bee demonstrations. Everyone for some reason assumes that no one is going to get stung. A mother held up her toddler so she could get a better look as I put my little colony inside a nuc box. But these bees were docile, as swarm bees generally are, so there were no unfortunate surprises.

The bed of my recently acquired 1998 Chevy pickup was full of honey supers and general bee junk, so I threw my aluminum ladder on top of the pile.

Butch said, "How about a beer?" and of course I said sure.

I didn't actually get an invitation to this party Sharon called earlier about the swarm, but I'd been tied up all day at the state bee meeting down the road at Paul's, and I happened to arrive at Butch's just as guests were sampling his homemade Merlot. But I can socialize, when I have to. I encouraged a woman who said she wanted bees of her own. I told a story or two.

When I slammed my truck door to leave, the back window honeycombed and fell out.

I tried to take this in stride. It was getting dark, and my main concern was that there might be glass in Butch's driveway I went back to find him. "I have no idea how this happened," I said.

"I'll tell you how!" Butch said cheerfully "When you threw that ladder in your pickup, it bounced off the window "

"Oh," I said.

My cousin Hal in Grand Junction found this truck for me last March. He's truck-savvy, and he's always checking the for-sale ads. I told him I wasn't particular I wanted 4WD, and I didn't want to break the bank. It was always something with my '86 Ford F150, and I needed a reliable pickup.

Hal found my Chevy right away – 11 years old, but with only 78,000 miles on the odometer He said, "It's a tight little rig," and I said, "Buy it!" I owned it before I ever laid eyes on it.

Not only that – he found a buyer for the F150! I took it down to Grand Junction and drove the Chevy back. The buyer had a braided ponytail, lots of tattoos and not too many teeth. When I started to recite the truck's idiosyncrasies, he cut me off. "No problem," he said. "Me and my brother are Ford guys."

This was so easy! Hal made a few bucks, I made an upgrade, and I got spared the agony of truck shopping. I felt like Cousin Hal was my very own personal assistant.

I immediately discovered a significant problem, however With the F150, I could haul 12 hives – four rows of three, with the bee frames parallel to the truck frame. The middle two rows between the wheel wells were a tight squeeze, and I had to remove the outer covers, but I always made it work. Twelve hives. I loaded that way a million times.

The Chevrolet is ever so slightly narrower between the wheel wells, and three hives won't squeeze. This means I can haul three hives in the front row, two each in the two rows between the wheel wells, and three at the tail end. That adds up to ten, but I didn't step up from a half-ton Ford to a three-quarter ton Chevy to pack a lighter load!

Life is never perfect, however I opted to replace my broken window with a slider, so when I get a cab full of bees, I can let some out.

The mobile glass replacement guy took a shine to my funky little property You do kind of feel like you're at Grandma's house here. He couldn't take his eyes off the bees. He said he'd always wanted bees. If he ever got some, would I be his mentor? Well, of course I would. He knocked $20 off my window price, and when he repaired three windshield cracks on two other vehicles, he only charged me for two. I gave him some honey This is how I like to do business!

Last week, my '83 Ford one-ton flatbed conked out between here and town. At least it wasn't the day before when I had 25 hives on board. I jumped out and was headed around the corner back to the house and a phone when a county truck stopped. The driver was the county weed control supervisor "You're Ed, right?" he said. "I'm Steve. "I sprayed your bees a few years back, remember?"

Oh, yes, I do, Steve. And I wonder why you hate sweet clover so. Thanks very much for the ride.

Down at the New Castle Garage, Jim says he'll look at the flatbed just as soon as he can, so it could be awhile.

Meanwhile, my bees are making honey at 9,000 feet on the Flat Tops. I need to get another yard set up there. I've still got the pickup. Two 12-hive loads, and I'd have it. Make that three, with the Chevy

Ed Colby

Chevy Truck