May 2008

Bee Culture

www.BeeCulture.com

Catch The Buzz

Inside In May

ROOT PUBLICATIONS

$4.99

85
7 35048 28163 9

Shaded from the hot Summer sun by an old mulberry tree, this apiary serves as an outdoor classroom for the Carroll County Beekeepers Association at the Hashawha Environmental Center near Westminster, Maryland. (photo by Steve McDaniel)

800.289.7668 • www.BeeCulture.com

Publisher – John Root

Editor – Kim Flottum, Ext. 3214, Kim@BeeCulture.com

Production Coordinator – Kathy Summers, Ext. 3215, Kathy@BeeCulture.com

Circulation & Advertising – Dawn Feagan, Ext. 3220, Dawn@BeeCulture.com

Contributors

Clarence Collison • James E. Tew • Ann Harman
Malcolm T. Sanford • Steve Sheppard
Larry Connor • Connie Krochmal

Subscription Information

U.S., one year, $25; two years, $48. Newsstand price: $4.99. All other countries, (U.S. Currency only), $15.00 per year additional for postage. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), May 2008, Volume 136, Issue 5, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Contact Information

V800.289.7668 • V330.725.6677 • F330.725.5624 • www.BeeCulture.com
email: info@BeeCulture.com

Advertising

For information on advertising contact Dawn Feagan at 800.289.7668, Ext. 3220

POSTMASTER: Send address changes to BEE CULTURE, The A.I. Root Co., 623 W. Liberty St., Medina, OH 44256

Opinions expressed in articles or columns in this magazine are not necessarily those of the Editor or Publisher.

Published by The A.I. Root Co. Copyright© 2008 by The A.I. Root Co.
All rights reserved.

Bee Culture The Magazine of American Beekeeping *is* PRINTED WITH SOY INK™ Trademark of American Soybean Association *on* *Recycled Paper*

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

MAY 2008 VOLUME 136 NUMBER 5

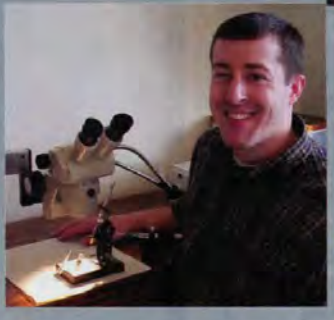
FEATURES

DEPARTMENTS & COLUMNS

MAY 24
Medina, OH
Field Day

Western Reserve Beekeepers & Medina County Beekeepers at The A.I. Root Company 623 West Liberty Street Medina, OH

JENNIFER BERRY
•Small Cell & Natural Beekeeping
• Outside – Pest & Disease Analysis
• Nutrition Research (if it rains)



JOE LATSHAW
Latshaw Apiaries
•Ohio Queens
• Outside – Queen Analysis
• Evaluating Queens

Jim Bobb
PA State Beekeepers President, EAS Chairman
•Honey Plants
• Outside – Beginning With Bees

$20 for non-members of Western Reserve Beekeepers ($20 Registration includes $5 WRBA Membership)
$15 for current WRBA members
Pre-Registering by May 19 guarantees FREE Hot Lunch
To Register Call – 866.829.9233 or
Send check to: Western Reserve Beekeepers, P.O. Box 1837, Hiram, OH 44234 or
email: jamie@blueskybeesupply.com

www.westernreservebeekeepers.org

. . . At The Expense Of The Helper

Please accept my compliments and thanks for the continuing excellence of Bee Culture.

It appears that CCD is a continuing problem that is certainly getting the attention of the public, if not answers. Funding research may alleviate some of our anxiety about feelings of helplessness but will probably leave beekeepers without the means of maintaining the thousands of strong colonies needed for pollination. Traveling along I-5 from Redding, California to Corning I see hundred of acres, perhaps more, of new almond plantings that I presume will need pollination service in the next decade. Can we import bees, like honey, from foreign sources to make up domestic needs, assuming, of course, that such are free of afflictions?

Let us pretend that we can communicate (in our language) with our bees. No doubt they would speak of outrageous impositions they are subjected to by their keepers; artificial diets, disturbing dislocations, unsuitable housing and, worst of all, having to suffer a polluted environment caused by having so many humans in close proximity!

Scientists probe into the amazing innermost secrets of honey bee lives but do not, out of professional reticence or restrictions, speculate publicly what the real problems are with honey bees under human management. If we would honestly and accurately interpret the messages from our bees we would be unhappy and frustrated by the decoded information we would receive. Our human world founded upon the lavish expenditure, abuse and overuse of earth's resources is now showing up at the expense of the helpless, and we pretend that the answers can be found if we call on Washington to fund more bee research.

Larry Goltz
Redding, CA

Problem Finder

In the December 2007 issue a letter from Chris Baldwin got me to thinking.

He is a hard working beekeeper and pollinator, but I think he knows what's happening by the title of his letter "Something Sinister " In his next to the last paragraph he states "Either there is something terribly wrong with our environment, or we've really screwed up the genetics of our bees. I believe it's both."

Well there it is. Now what's the answer Do we outlaw beekeeping and return them to the wild? That's one thought. I'm not a problem solver only a problem finder and there are plenty of those out here.

Jim Cowan
Aberdeen, WA

Bees Vs. Mites

I especially enjoyed Professor Seeley's "The Bees Of The Arnot Forest" in your March issue. The apparent non-transference of the bee-mite equilibrium to the outside regions is discouraging, though! On the brighter side, in areas where there is a continuous influx of non-resistant queens from southern breeders, those who propagate from their own stock have one remote advantage. If dominant survivability is even attained, the bees will already be relatively better tested. Five years is the longest survival time for an untreated colony of which I have personal knowledge (2002 to 2007).

From past discussions with someone engaged in private research of the American Chestnut blight fungus, I believe there are many parallels with the bee vs. mite scenario. Although the great chestnut forests were essentially devastated by blight nearly 100 years ago, with much less genetic diversity and slow breeding time, the outlook is gloomy for there being a 100% blight resistant pure American Chestnut tree in the foreseeable future. Only a scattered handful of old, nut bearing trees have been found. Although generally damaged by blight, these trees continuously throw it off for many years. The feral bees reclaiming the woods will not be finding mature chestnut trees or their dead snags for homes.

Roland Walls
Beckley, WV

Boardman Correction

The article on the Boardman Feeder in the February, 2007 *Bee Culture*, was oriented to getting trouble-free operation from the device. The physics of operation were avoided to simplify the recommendations. I overstepped my "poetic license" by stating that surface tension holds up the weight of the syrup in the inverted jar Frederick Burdell, a middle school science teacher turned beekeeper, in southeast Ohio, was irate about the glaring error We both knew that atmospheric pressure is slightly lower in the trapped air at the top of the inverted jar by virtue of the suction of the weight of syrup. The weight of the syrup, then, is suspended between full atmospheric pressure at the holes in the cap and the reduced pressure in the trapped air at the top. The difference in pressure across the fluid (about 2%) offsets the gravity (weight) of the syrup.

But it doesn't work without an assist from surface tension across the holes. Hole size affects how much help surface tension provides and that was the thrust of the article. Hole size is something we can control or pay attention to in use of the gadget. I regret, and apologize for, any inconvenience that may have been caused by my over-simplification.

Walt Wright
Elkton, TN

A New Leaf

Today I read Ann Harman's article in the January 2008 issue of *Bee Culture* in which she asks, Can

you guess who first said: "I'll turn over a new leaf."

Answering her own question she asserts, "It's from Cervantes' "Don Quixote de la Mancha" written in the early 1600s."

It's a rare occasion when Ann Harman is incorrect, but in this case she has erred. "I'll turn over a new leaf" is a much older question than the 1600s, and it actually goes back many, many centuries further to the Garden of Eden when Adam first saw Eve.

Respectfully submitted,

Aaron Morris
Round Lake, NY

Sensitive Bees

I enjoyed meeting you and hearing your presentations at the recent NC State Beekeepers Spring meeting. I mentioned to you that my grandfather had been an A.I. Root dealer for years and he had a thorough zeal for beekeeping. I came home charged-up for getting back into my beekeeping, which I've neglected somewhat in the past year When people ask if I've lost any bees to CCD, I reply, "No, I lost mine due to SBK." "What's that!?"

"Sorry Bee-Keeping."

Anyway, I took my smoker and walked among my hives the other day I decided against opening any hive due to the wind, but I wafted a small puff of smoke in the entrance of one hive where there wasn't enough activity Instantly the bees came out to investigate.

It suddenly struck me that these little insects are so sensitive to such small chemical stimuli that it's beyond our comprehension. In a creature that takes its cues from milli-micro-amounts of pheromones, how much of an assault is it when beekeepers cram their hives full of chemicals? If a bee carrying a *Varroa* mite is analogous to a person carrying a snapping turtle on his back, a beehive with coumophos strips must be like us entering a small closet loaded with several bushels of mothballs. Checkmite strips do have a discernible odor, even if it's only the vinyl strips.

I lose bees each year to various causes. I have never treated with any chemicals. I have hives that have thrived with no treatments while the neighboring hive dwindled and died. The USDA and contemporary approach is to dump more "cures" into the bees. We all want that magic bullet that will fix everything. I used to be a commercial hog farmer and I've seen firsthand the deleterious effects of various antibiotics (yeh, they're supposed to help), mange sprays, etc. While the immediate effect seemed to work, the long-range residual effects of resistance, poisoning, etc, were ignored in trade-off for the immediate relief. Our quest for effective, efficient and affordable (not to mention quick) treatments has left us with bees unable to cope with the pests and with pests that remain stronger and unabated in their quest to take over the world.

I found myself nodding in agreement with your presentations, as you validated my thoughts. I will be splitting my strong survivor hives and rearing queens from those. I agree that we need to work regionally and locally to engineer bees suited to our environment and concentrate the desirable genetics and behavior of survivor bees. In the livestock business, sires and dams are selected for various traits important to that producer and his management system. A producer in ND would not generally select African Zebu or Indian Brahma cattle for his climate. Likewise a sub-tropical producer is unlikely to select Black Angus. We beekeepers import queens from anywhere and everywhere, not knowing what they are, or how they work. We buy based on the recommendation of other beekeepers (how smart is that sometimes?) and the advertisements, claims and reputation of the queen producer But, most often, we buy queens from wherever we can get them, because they are hard to find. We usually buy them too late, that is, after we already have a failing or failed colony

Bob Gaddis
Grifton, NC

New & Exciting For Beekeepers

The Microscope Store, LLC (www.microscope.com) formally launched its special, online, microscope package designed to assist beekeepers in their continuing battle against colony collapse disorder (CCD) Recommended by the popular writer and beekeeper, Randy Oliver, the Omano OM36L is a high quality compound microscope that is helping to change the way beekeepers diagnose infection by the parasite *Nosema*.

The Beekeeper Microscope Package includes an Omano OM36L microscope, aluminum carrying case, rubber eyecups and a free slide kit that includes slides, cover slips, cleaning cloth and 16cc immersion oil. The microscope has four objective lenses, 4x, 10x, 40x, 100x (oil immersion) with both the 40x and 100x objectives being spring-loaded to minimize damage. Features include reverse-facing nosepiece for convenient specimen handling, dual coaxial focusing knobs for more convenient focusing, a 1.25 N.A. Abbe condenser ad oversized mechanical

stage. The package is offered at a special discount to beekeepers and is priced at $496.95.

For further information, please contact Charles Crookenden, 540 719 1990 or email charles@microscope.com.

Bee Hotel

Bee-Zy Hotel open for season. All hives brought up to code. Running water and outhouse. All welcome. We are hoping for a Bee-Zy season.

Michael Nite
Stewartstown, NH

Bee Sting Therapy

Thanks for sending the Bee Sting therapy article. It was very interesting, but also surprising to read they have 'just discovered' this system of treating patients, as my 'private' doctor (ie not National Health disService 'run' by our (U.K.) government) has been using this method for many years, also for patients suffering from multiple food and chemical allergies/intolerance, such as myself. After the NHS professor had to give up on me last summer/autumn as I was having such adverse reactions even to his 'minute' doses, she in fact offered me two ways of treating the bee sting allergy.

The NHS system works using incremental dosage, which is in fact highly dangerous – and did me no good at all!

Doctor Jean Monro offers a method, using the entire bee, highly diluted to x million, and can completely desensitise a patient. This is rather expensive and takes about two years of treatment.

She also uses a method with decreasing doses until she finds the dose you can tolerate, which can take just a couple of hours. A vaccine is then made up to your degree of tolerance. I can only tolerate a dose of 1 1,562,500. Stronger than that and I get reactions swelling of tongue, hives, streaming nose etc.

This is a much less expensive method, and I now have a vial of vaccine which I can inject daily during the bee season, but I am not desensitised as such. However, if I have the vaccine each day I will be OK if I get stung, but I need to take it daily to be covered.

In case any of your readers are interested, this method is also available at the Dallas hospital set up by Prof William Rea (who I have met over here at my dcotor's Breakspear Hospital). He has been practising desensitisation of patients with literally hundreds of different allergies/intolerances for at least 35 years. Dr Monro has been doing it for about 30 years, having learnt much from him when this branch of medicine was in its infancy People quite literally travel from all over the world to be treated by Dr Monro – including from America!

Environmental Health Center-Dallas, 8345 Walnut Hill Lane, Suite 220, Dallas, Texas 75231, 214.368.4132 • Fax: 214. 691.8432

Marianne Nash
Great Missenden, England

Three-Year Cycle

A friend recently posted on Bee-L: "During the past decade in New Hampshire, we've seen major Winter losses (50-90%) on a two to three year cycle in operations that run 50-200 colonies.

That has been exactly my problem. I am in the Upper Peninsula of Michigan, and the cycle has been:

First year· Start with three or four nucs or packages (I've been using Carniolans, because they are reputed to be reasonably well-suited to our cold, wet climate with long Winters). They do well all Summer, and all colonies overwinter successfully

Second year· Make splits from overwintered hives, install new queens.

All hives do well, with the overwintered parent colonies becoming very strong. But, early in the winter the strong parent colonies die, leaving only the ones made from splits.

Third year· The overwintered splits initially do well, and additional splits are made from them to make up for the dead colonies. But, then at the end of the Summer, about half of them abruptly die over about a two week period in late September The surviving colonies go into the Winter OK at first, but then they dwindle down and die sometime in February and March.

I've been through this cycle three times now. The first two times, I was treating for *Varroa* with Apistan, and this last cycle I was dusting them with powdered sugar every two weeks, and the treatment method didn't seem to make any difference. The mites were there, and the quantities were increasing the whole time, so this was probably caused by them, but I just can't seem to keep them down. I'm beginning to think that I'd go through exactly the same cycle if I didn't treat at all. It's very frustrating, I can't even breed from survivors because the third year, nothing survives. I suppose I can just resign myself to starting over every third year, but it rankles.

Can anyone suggest how I can cure this problem? Please keep in mind the constraints of my climate:

(1) It never gets hot in the summer, peak temperatures are only about 80°F and that only lasts about a month (late July early August), so mite treatments that require high Summer temperatures are out.

(2) The period of time when bees can make honey only runs from about June 1 to September 1, and their flight period only lasts from about mid-April to mid-October So, my window of opportunity for making splits is very short, and any mite treatment that has to be applied during the Summer and contaminates honey for a period will basically mean that I never have a "clean" time to make honey for human consumption at all.

I realize that this has been gone over and over for years, but the problem I have is that either (1) I can't sort out the successful people who have to meet the same climate constraints as I do, or (2) I can't tell whether someone who appears to be successful is actually just on the second year of their cycle, where it looks like everything is going just peachy.. The local beekeepers that I speak with all seem to have the same sort of problem.

Thanks for any advice, I hope somebone has found a way to beat this cycle in cold climates.

Tim Eisele, tceisele@mtu.edu
Atlantic Mine, MI

INNER COVER

On Wednesday April 9th there was a Senate Briefing called by Senator Boxer from California to find out where the heck the money for CCD research was, and why hasn't it already been distributed. I'm writing this right before it happened, right before, but such are deadlines. Any good news that comes of the hearing will be immediately distributed on CATCH THE BUZZ (as was the announcement), so if you're signed up for that free news service you already know what happened. If not, well, you missed an opportunity (check out our web page to sign up for the BUZZ).

But the evening before the hearing I received a preliminary report authored by Dennis vanEngelsdop, Jerry Hayes, and Jeff Pettis on the loss of honey bee colonies over the winter of 2007 – 2008, from a survey conducted by the Apiary Inspectors of America and the USDA Beltsville Lab. This preliminary report was given at the Briefing, so now you know as much as the Senators know. Or did know back in early April.

Here's what the report said. AIA's survey estimated losses between September 2007 and the beginning of 2008, and the USDA surveyed beekeepers pollinating almonds in California during February 2008. Together they touched about 18% of the country's estimated 2.44 million colonies. That's a pretty good sized sample. A total loss of 35.2% of managed honey bee colonies was recorded. This represents a 3.2 point, or 10% increase in total losses as compared to last year The 327 operators surveyed in 2007-2008 lost on average 31.4% of their colonies, the report stated.

Further, 42 percent of surveyed beekeepers reported having higher than normal losses. Those reporting abnormally high losses reported having a total loss of 43.7%, while those reporting normal losses reported a 22.9% loss. This means that the beekeepers surveyed feel that losing nearly a quarter of their colonies overwinter is normal (which in my experience it is), but those losing twice that amount felt that was too high. Go figure... almost 44% loss. Who can take that year in and year out?

Unfortunately, the survey was not able to differentiate between true cases of CCD and colonies lost to causes that share the 'absence of dead bees' symptom. However, the 36% of the operations that reported having at least some of their colonies die with the symptom had a total loss of 41.3% of their colonies. This compares to the 17.5% colony loss reported by beekeepers not reporting losses with this symptomology This means then, that an operation that gets hit with CCD, on average, can expect just over a 40% loss, while no CCD losses are less than 20%. CCD, then, doubles Winter losses, if I read this correctly. *Overall, at least 71% of all colony deaths can be attributed to non-CCD causes, underlying the need for research, not only into CCD, but into pollinator health in general.*

One question not addressed, at least in this report, is what do you do with the dead? Irradiation has been tried and found to clean up equipment that had CCD problems. But is that realistic for many? Some? Any, really? Hauling thousands of supers hundreds of miles, paying to treat and hauling them home...the logistics, and the cost need to be examined in detail before committing to that expense. And if that isn't realistic? Air them out say some... so sunlight and the weather get inside...a good dose of UV light might help. Killing whatever with some of our Winter weather might do it, too. If you can get them there. Another suggestion is to go ahead and use them, but treat like mad for Nosema So, anyway, what do you do with the dead?

The only symptom attributed to CCD still remains the rapid loss of most of the adult bees, leaving behind brood, a queen and young bees. The researchers are routinely stating that CCD is the result of a multitude of issues coming together in the right combination at the right time.

But a review for this season is certainly in order starting with nutrition. New feeds help make up for inadequate food, but that's all they are doing – making up. There's lots of skinny bees, it seems, when what we want are fat bees. So what's wrong with trapping and feeding pollen? Bees don't eat soybeans, milk byproducts and vitamin pills. They eat pollen.

Carbs? You bet. Sugar is better than HFCS. Honey is better than either

Is home safe? Are the frames your bees live on and store food in and raise their children in clean, pure and natural? Old frames are not old friends. Get rid of them.

That new Nosema keeps coming up, too. You need to be ahead of it. It will fool you. It's a Summer problem so you need to treat in the Spring... maybe in the Summer, too.

Well, you need to monitor for mites, still. You need drone comb, sugar dusting, screened bottom boards, Summer splits. If all these fail you need to Summer treat. You have to take care of the bees that take care of the bees that go into Winter That means a July or August window.

Other stresses? Sure. We can round up the usual suspects. Chalk, European, American, wax moth, small hive beetle...the list goes on.

But all of these...poor food, poor homes, the pests, the diseases, the viruses... each is only a mile marker on the road to perdition as far as your bees are concerned. Each counts a little but they all add up. And in the end they kill.

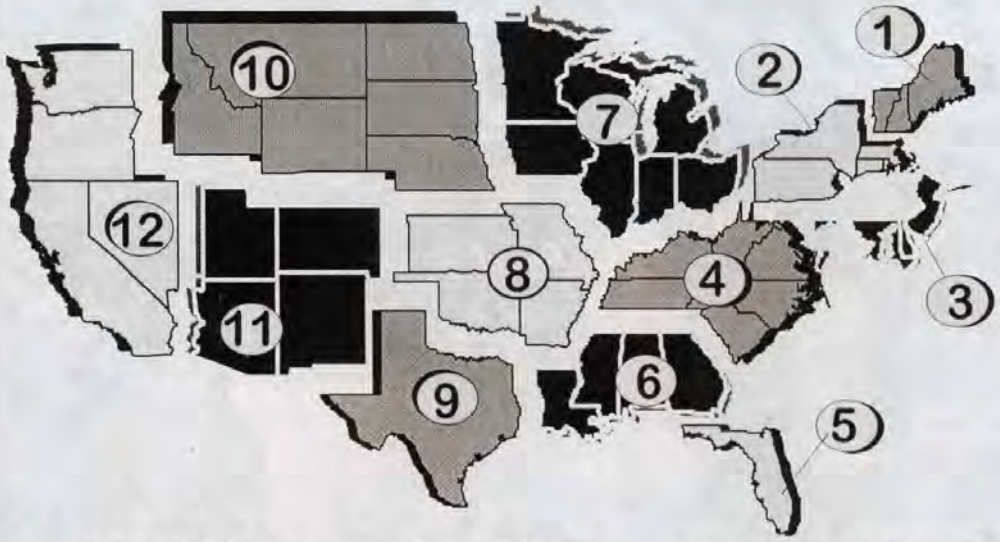
•

A couple of good meetings to take advantage of this month...the Young Harris meeting in Georgia, and the Western Reserve meeting right here in Medina. If you're anywhere near, either would be a great way to spend some quality time with beekeepers and bees.

In any event, keep your smoker lit, keep your hive tool sharp, and keep an eye out for those mile markers.

CCD Briefing

MAY – REGIONAL HONEY PRICE REPORT



WINTER LOSSES

We surveyed our reporters this month on their assessment on their winter losses. Overall, it seems to be a bit better this year than last, but there are some locations that got clobbered with harsh winter weather. Our reporters don't quite reflect the general beekeeping population since there are a good number of beekeepers that don't sell honey, or don't sell enough to quote. But for those that do, we have a good representation.

3% run 1000 or more colonies and could be considered commercial; 32% run between a 100 and 500, and would be considered serious sideliners; and 65% run fewer than 100 colonies, and although there are some who would be in the sideline category, most are hobbyists.

Losses are in the eye of the owner certainly, and what you consider a terrible loss in actual numbers, would be only a decimal point for others. Nevertheless, overall, 39% considered their losses low; 34% moderate and 23% high. This compares to last year with 34% low, 46% moderate and 20% high, so the severity of loss this year seems to be higher overall, no matter how many colonies a reporter had.

But how many, really, were lost. Let's take a look. 10% reported no losses at all, up from 7% last year. 44% lost 10 or fewer, same as last year. 39% lost between 10 and 100, again the same as last year. 6% lost between 100 and 500, down just a tad from the 8% of last year, and 1% lost more than 500, down a % from last year. About the same, really.

What killed these colonies? Good question. Of course most beekeepers have colonies die for different reasons, so these numbers reflect that. Pesticides – 11%. Nosema – 11%. Disappeared and don't know why – 26%, which probably bears further investigation, but what do you investigate? Starved – 67%, either because they couldn't move, or plain ran out of food. Varroa – 42%. Other pests and diseases – 16%. Bear, skunks and vandalism seemed to get about 20% of these, 9% complained that queens crapped out and the colonies died from that. So, how did yours do?

	REPORTING REGIONS												SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.23	1.35	1.20	1.16	1.20	1.40	1.16	1.25	1.27	1.19	1.19	1.17	1.16-1.40	1.23	1.21	1.05
55 Gal. Drum, Ambr	1.08	1.25	1.08	1.17	0.98	1.08	1.15	1.25	0.92	1.08	1.03	1.08	0.92-1.25	1.10	1.07	0.95
60# Light (retail)	110.00	122.00	120.00	110.67	110.00	120.00	110.50	109.15	110.00	121.28	120.04	133.33	109.15-133.33	116.41	117.50	106.88
60# Amber (retail)	110.00	113.33	120.00	108.67	110.00	127.50	105.11	105.00	100.00	119.86	120.04	139.00	100.00-139.00	114.88	111.09	104.80
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	47.52	60.98	41.40	41.99	61.48	54.00	41.33	61.48	61.48	35.76	41.40	56.00	35.76-61.48	50.40	51.35	47.68
1# 24/case	62.33	68.53	68.40	61.65	82.20	75.07	63.63	68.80	54.00	82.38	69.20	81.00	54.00-82.38	69.77	72.99	65.76
2# 12/case	64.08	63.72	63.00	55.13	73.00	60.60	57.75	72.00	50.50	57.84	54.85	68.50	50.50-73.00	61.75	62.65	59.54
12.oz. Plas. 24/cs	58.56	63.18	49.80	59.43	57.00	64.00	52.23	56.80	48.00	57.64	56.00	62.00	48.00-64.00	57.05	57.21	52.58
5# 6/case	74.25	71.74	71.25	62.10	72.45	75.00	67 12	77.40	60.00	66.75	72.75	83.00	60.00-83.00	71 15	70.38	66.64
Quarts 12/case	76.71	100.35	112.20	86.63	78.00	76.80	84.00	84.75	102.00	120.00	81.12	105.00	76.71-120.00	92.30	93.73	87.50
Pints 12/case	55.88	51.95	66.00	57.40	58.00	47.00	48.75	48.60	66.00	51.84	48.35	58.50	47.00-66.00	54.86	54.06	53.91
RETAIL SHELF PRICES																
1/2#	2.88	2.85	2.27	2.89	3.78	2.50	2.60	2.30	2.54	2.64	2.59	4.25	2.27-4.25	2.84	2.76	2.56
12 oz. Plastic	3.25	3.88	2.78	3.33	4.00	3.50	3.16	3.65	3.43	2.90	3.47	4.16	2.78-4.16	3.46	3.44	3.25
1# Glass/Plastic	3.73	4.36	3.66	4.16	4.60	4.28	3.78	4.51	4.33	3.98	4.62	5.90	3.66-5.90	4.33	4.21	3.99
2# Glass/Plastic	7.75	7.55	6.43	6.14	7.00	6.65	6.30	8.16	6.72	5.43	7.45	8.75	5.43-8.75	7.03	7.03	6.60
Pint	6.62	7.38	6.50	5.65	5.95	5.00	5.18	5.57	5.72	6.69	5.69	8.50	5.00-8.50	6.20	6.28	6.08
Quart	13.50	9.48	11.00	9.58	8.75	8.26	10.22	9.60	10.13	13.55	9.15	14.50	8.26-14.50	10.64	10.61	9.91
5# Glass/Plastic	17.50	14.66	15.65	13.47	18.00	16.00	14.65	17.50	20.00	12.79	15.86	17.50	12.79-20.00	16.13	16.39	14.66
1# Cream	4.75	5.98	4.89	4.75	5.46	4.00	4.74	5.09	3.99	5.25	5.71	5.75	3.99-5.98	5.03	5.09	4.97
1# Cut Comb	5.00	4.47	5.19	5.25	7 12	4.17	6.72	5.00	7 12	7 12	8.00	7.25	4.17-8.00	6.03	6.47	6.00
Ross Round	5.63	3.97	4.97	5.00	5.63	4.00	5.50	6.50	5.63	5.63	6.50	6.00	3.97-6.50	5.41	5.81	5.46
Wholesale Wax (Lt)	2.00	3.48	2.00	2.41	2.15	2.67	2.08	3.00	3.25	2.15	2.92	3.71	2.00-3.71	2.65	2.33	2.49
Wholesale Wax (Dk)	2.00	2.97	2.00	2.19	1.97	2.33	1.96	2.75	1.95	2.94	2.65	2.10	1.95-2.97	2.32	2.10	2.14
Pollination Fee/Col.	60.00	79.33	47.50	44.17	155.00	52.00	49.00	55.00	125.00	140.00	95.00	110.63	44.17-155.00	84.39	68.49	79.67

RESEARCH REVIEWED

The Latest In Honey Bee Research

Steve Sheppard

"*Nosema ceranae:* Historical evidence for high virulence "

A number of recent papers have reported the occurrence and spread of a new-to-apiculture microsporidian that is of great concern to beekeepers. The culprit is *Nosema ceranae*, a pathogen that comes to our honey bee courtesy of a shift from its original host *Apis cerana*, the eastern honey bee. Astute readers will note that a similar host-shifting scenario involving the eastern honey bee brought *Varroa destructor* to our attention and apiaries. The *Nosema* pathogen already familiar to U.S. beekeepers, *Nosema apis*, can be a major problem in overwintering colonies where dysentery can assist its rapid spread within a Winter cluster However, with the arrival of warmer weather and foraging conditions in the spring, the incidence of *N. apis* infection in surviving colonies typically declines. Consequently, beekeepers in temperate regions of the U.S. sometimes consider *N. apis* to be a minor problem. In contrast, *N. ceranae* is apparently able to continue its cycle of infection in seasons other than Winter and has been associated with major honey bee losses in Europe, even from warmer locales. There is growing evidence that this pathogen is now widespread in U.S. honey bee populations and, indeed, may be a major piece of the puzzle to explain our own decline in honey bee populations. As the story continues to unfold, a recent scientific paper from Europe reported that *Nosema ceranae* has been in Europe for at least a decade and, further, a decade ago it may have been much more virulent than *N. apis* (Paxton et al. 2007).

Paxton and colleagues conducted a survey to look for the historical presence of *Nosema ceranae* in Finland and an experiment to compare the virulence of *N. apis* and *N. ceranae* to *Apis mellifera*. For the survey, the researchers used bees from 28 *Nosema* infected colonies that were sampled between 1986 and 2006. The *Nosema* species infecting each colony was determined using a molecular biology protocol that involved extracting DNA from the *Nosema* spores, amplifying a specific portion of the DNA using a technique known as polymerase chain reaction (PCR) and then cutting the DNA with special enzymes. The resulting DNA fragments were then separated on a gel and different sizes corresponded to either *N. apis* or *N. ceranae*. They found that colonies in Finland from as early as 1998 were infected with *N. ceranae*. By 2006, every sampled colony they examined was infected with *N. ceranae*, although some were also co-infected with *N. apis*. In the 24 samples from the survey that had been taken in Spring (March-May) they found significant differences in the number of spores per bee, dependent on whether *N. ceranae* was present. In bees infected with *N. apis* alone, the counts ranged from one to 34 million spores/bee, while bees infected with *N. ceranae* alone or with both pathogens contained from one to 158 million or one to 83 million spores/bee, respectively

In the virulence experiment, Paxton and colleagues established two cages of *Nosema*-free worker bees. They then fed each individual bee in one cage with 10 µl of a sugar solution containing 100,000 spores of *N. apis* that had been collected in 1994 from Sweden. In the other cage, the researchers fed each individual with an identical spore load of *N. ceranae* that originated from Chinese *A. cerana* in 1994. At periodic intervals, bees were removed from the cages and used to determine spore counts. Bee mortality in each cage was monitored from inoculation through day 15. The results indicated that for about the first week following inoculation, the spore counts in the *N. apis* infected bees increased more rapidly than those in the *N. ceranae* infected bees. However, by day 14 bees from both cages contained approximately equal numbers of spores (about 27 million/bee). The researchers noted that, by day 14, it appeared that the increase in spore counts in *N. apis* infected bees was leveling off, while the spore counts in the *N. ceranae* infected bees were still increasing. The authors could not further test this idea, due to the high level of mortality in the *N. ceranae*-infected bees. Thus, on day 15 only 56% (14 out of 25) of the bees infected with *N. ceranae* were still alive, whereas 92% (23 out 25) of the bees infected with *N. apis* remained.

In the Discussion, the authors noted that their discovery of *N. ceranae* in European bees sampled from 1998 was similar to research reported from the U.S. that *N. ceranae* had been present since1995. They point out that because the host-shift may have been quite recent, the rate of spread of *N. ceranae* worldwide was much more rapid than that of *Varroa destructor* They cite as "great concern" their finding of the apparently higher mortality of *A. mellifera* associated with *N. ceranae* compared to *N. apis*. The fact that the experiment was conducted with *N. ceranae* taken from its original host (*Apis cerana*) collected in 1994 leaves open the possibility that the virulence of *N. ceranae* infecting European or New World *Apis mellifera* may have changed over time and between hosts. Nonetheless, the authors make the point that if the higher virulence of *N. ceranae* is shown conclusively, that it "could account for the unusual reported course of nosema disease in central and southern Europe over the last few years, in which nosema disease is a year-round phenomenon rather than a spring disease, and is associated with higher colony losses."

Whether *N. ceranae* turns out to be the primary culprit, one of several causes or even a relatively minor player in what has been called colony collapse disorder in the U.S. may still remain to be answered. However, for U.S. beekeepers the implications of the research reviewed this month are clear We need to be cognizant of and learn from the international situation and pay special attention to our bees for signs of *Nosema* infection, even outside the typical "season." In addition, as we come to recognize *N. ceranae*to be a major new pathogen of *Apis mellifera*, with the potential to impact beekeeping worldwide in ways that could rival or surpass *Varroa destructor*, perhaps we can learn from the past and strive to preserve the effective longevity of control products by refraining from their overuse. BC

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

Paxton, R.J., J. Klee, S. Korpela and I. Fries. 2007 Nosema ceranae *has infected* Apis *mellifera in* Europe since at least 1998 and may be more virulent than Nosema Apis. ***Apidologie*** 38:558-565.

HIDDEN SPRINGS APIARIES

QUEENS

1-9	10-49	50-up
$13.00	$12.00	$11.00

Marking $1.00 each, postage additional
Visa/Mastercard Accepted
974 Bethany Rd.
Williamson, GA 30292
770.412.1703 Toll Free 877.483.1739

Long Creek Apiaries, Inc.
Certified Russian Bees and Queens*
Queens $25.00 Ea. Packages $75.00 Ea.
Prices do not include postage
Shipping season starts May 1st
depending on weather
*Produced under approved USDA-ARS protocol
3223 Long Creek Rd., Parrottsville, TN 37843
Phone: 423.623.2345 Fax: 423.613.4567
Website: http//www.longcreekapiaries.com
Email: sales@longcreekapiaries.com
Member Russian Honeybee Breeders Association

WEAVER'S FAMOUS QUEENS
BUCKFAST & ALL-AMERICAN
OVER 120 YEARS OF SERVICE
Visit us online at: www.rweaver.com
THE R WEAVER APIARIES, INC.
16495 C.R. 319, NAVASOTA, TX 77868
936.825.2333 • Email rweaver@rweaver.com

MASSACHUSETTS/NEW HAMPSHIRE
New England Bkpg Supplies Inc.
Spring Pkgs – April 14th & 21st pickup
5 frame Nucs – Ready May 15th
978.512.9222 • www.nebees.com

QUALITY WOODENWARE
10-frame Commercial Woodenware
(unassembled low volume prices)

Telescoping Lids	$11.29
Inner Covers	$4.41
Top Feeders	$11.40
Shallow Supers (rabbet)	$5.42
Midwestern Supers (")	$5 95
Deep Hive Bodies (")	$8 74
Bottom Boards	$7 73
Frames (any size)	$.65

Assembled, painted, quantity, budget, 5-frame and 8-frame prices available.
Assembled Screened Bottom Boards ..$16.70

NOW AVAILABLE
Finger (box) Joint Deep, Medium and Shallow Boxes (Add $1.25 per box)

CALL FOR FREE CATALOG
POOL YOUR ORDERS FOR DEALERSHIP PRICING
VISA MasterCard

- Full & Medium Depth Langstroth Dimentions
- Available in NEW BLACK & Standard White

No assembly required
NOT DAMAGED BY THE HIVE BEETLE

American Made • 100% FDA Approved Food Grade Material

10 Year Guarantee

- One-Piece Plastic Frame & Foundation
- Full Depth & Medium Depth Plastic Foundation – Beeswax Coated

Drone Comb Available

VISA MasterCard
INCORPORATED Pierco

Nick Lissaman
3900 Hamner Ave., Mira Loma, CA 91752
800.233.2662
nlissaman@snapware.com • www.pierco.net
Call for Distributor nearest you

Malcolm T Sanford

More Than Just The Honey Bee Genome

"Does Epigenetics play a role?"

The sequencing of the honey bee genome is expected to provide a series of potential benefits as I described first in April 2003 with a follow up article in December 2006. In the former article, I stated that findings revealed that the honey bee genome shows greater similarities to those of vertebrates than *Drosophila* and *Anopheles*, for genes involved in circadian rhythms, RNAi, and DNA methylation among others.

And, I said in December 2006: "It appears that the honey bee genome evolved more slowly than the genomes of the fruit fly and malaria mosquito. One consequence of that slower evolutionary pace is that the bee genome contains versions of some important mammalian genes that have been lost from the fruit fly and mosquito genomes. Is the honey bee more slowly evolving than most organisms, or have the fly and mosquito (both members of the same order, Diptera) evolved faster? And if it's the former, is that because of the bee's social lifestyle? These questions can only be answered with genome sequences for more species, and thankfully, more are on the way "

At this juncture, it might be worth defining more clearly the "genome sequences" noted above. DNA functions as life's universal dictionary· It acts as a template, making information available (by a process called "transcription") to an RNA template, which is called messenger RNA (mRNA). The mRNA determines (translates) the order of amino acids to make specific proteins. The "genetic code," therefore, is a set of rules or instructions where DNA determines the order of amino acids to make proteins via mRNA. This is accomplished by the sequence of the nucleic acids' respective units or nucleotides.

Only four nucleotides constitute the nucleic acids DNA and mRNA. Each nucleotide is characterized by a specific compound known as a "base." These bases are intimately associated with each other and must always be paired in a specific way, known as base pairs. Finding out the number and particular sequence of base pairs in a DNA chain allows scientists to not only examine, but also manufacture a specific organism's genetic code. Another way to look at this process is to visualize the base pairs as letters that are strung together into words, which then form sentences that in their entirety are the instructions for running an organism's life, its genome.

Most folks at some level are familiar with the above and for many the story seemed to end there; that organisms were stuck with the DNA they were born with (i.e. cards they were dealt in the genetic hand). But as in so much of biology, there's more. That is described in a topic that many people have not heard about, including this author, until he was told about it by an up-and-coming queen producer It's called epigenetics. We'll all be hearing more about this in the future. I hope you will remember that the first time you heard about this important field was in these pages.

Dubbed "The Science of Change," epigenetics is implicated in a wide variety of human illnesses and behaviors, including many cancers and respiratory, cardiovascular, reproductive, autoimmune, and neurobehavioral illnesses. Known or suspected drivers behind epigenetic processes include heavy metals, pesticides, diesel exhaust, tobacco smoke, polycyclic aromatic hydrocarbons, hormones, radioactivity, viruses, bacteria, and basic nutrients. [1]

The word epigenetic means "in addition to changes in genetic sequence." The term has evolved to include any process that alters gene activity without changing the DNA sequence, and leads to modifications that can be transmitted to daughter cells (although experiments show that some epigenetic changes can be reversed). Many types of epigenetic processes have been identified – they include methylation, acetylation, phosphorylation, ubiquitylation, and sumolyation. Epigenetic processes are natural and essential to many organism functions, but if they occur improperly, there can be major adverse health and behavioral effects. Other epigenetic mechanisms and considerations are likely to surface as study proceeds, and it is likely there will continue to be debate over exactly what the term means and what it covers.

One of the more studied epigenetic processes is DNA methylation, the addition of a methyl group (CH_3) to the DNA molecule. Again, note that this may interfere with subsequent transcription, but will not change the genomic sequence. Nevertheless, importantly, it will be usually passed on to daughter cells (the next generation). This has been implicated in Rett syndrome in humans, usually caused (95% or more) by a de novo mutation in the child (so it is inherited from a genotypically normal mother). Rett syndrome affects one in every 12,500 female live births by age 12 years and is an almost entirely female disease.[2] In other situations, it can lead to abnormal growth of tissues, overgrowth of abdominal organs, low blood sugar at birth and cancers. Similarly, in the imprinting disorder Prader-Willi syndrome, abnormal epigenetics causes short stature and mental retardation.[3]

Plants are also affected by DNA methylation. "This sort of mechanism is thought to be important in cellular defense against RNA viruses and/or transposons both of which often form a double-stranded RNA that can be mutagenic to the host genome. By methylating their genomic locations, through a still-poorly-understood mechanism, they (genes) are shut off and are no longer active in the cell, protecting the genome from their mutagenic effect."[4]

The addition of methyl groups to the DNA backbone is also used to distinguish the gene copy inherited from the father and that inherited from the mother This process is called "imprinting," as noted above

"Known or suspected drivers behind epigenetic processes include heavy metals, pesticides, diesel exhaust, tobacco smoke, polycyclic aromatic hydrocarbons, hormones, radioactivity, viruses, bacteria, and basic nutrients."

in Prader-Willie syndrome. It doesn't follow traditional laws of genetics, which describe the inheritance of traits as either dominant or recessive, where both parental copies are equally likely to contribute to the outcome. The impact of an imprinted gene copy, however, depends only on which parent it was inherited from. For some imprinted genes, the cell only uses the copy from the mother to make proteins, and for others only that from the father [5]

"Centuries ago, mule breeders in Iraq noted that crossing a male horse and a female donkey created a different animal than breeding a female horse and a male donkey. In the mid 1980s, scientists studying mice discovered that inheritance of genetic material from both a male and a female parent was required for normal development. The experiments also revealed that the resulting abnormalities changed depending on whether the inherited genetic material was all male in origin or all female.

"Why imprinting evolved in animals is unclear, but one hypothesis is that it represents a genetic 'battle of the sexes,' since many imprinted genes regulate embryonic growth. Maternally-expressed imprinted genes (for which the copy from mom is always used) usually suppress growth, while paternally expressed genes usually enhance growth. The 'battle of the sexes' hypothesis is partly based on studies in animals that suggest growth-promoting imprinted genes help ensure the continuation of the father's genes, a particularly important issue for species in which more than one male can contribute to a single litter of offspring. The mother, however, is more interested in maintaining her own health, biologically speaking, and hence her genes 'fight' the paternal genes and limit the size of the embryo or fetus."[6]

Does this remind readers of any particular organism? How about the polyandrous honey bee? Paternity matters in honey bees in several ways. First as seen in these pages and elsewhere, it has been revealed in study after study that diversity makes a big difference in colony productivity and that it is achieved via the contribution of a number of drones (the more the better?) to a queen's sperm supply. It also matters when it comes to Africanization of European honey bees; studies appear to show that drones are far more important in the process than queens. It only takes the influence of a few African drones to produce an over-defensive colony

There's also evidence that some imprinted genes may play a role in social behavior, particularly in nurturing situations. Mother rats that are good moms, for example, can permanently change the way the genes of their offspring act, causing their pups to be calmer throughout adulthood.

The following appears in a recent abstract with respect to sociological study in humans: "The methods and theoretical repertoire of the biomedical sciences are undergoing rapid change fueled, first and foremost, by advances in genomics and molecular biology. Advances in the understanding of epigenetic regulation have begun to fundamentally change notions of inheritance and development and to differentiate the central dogma of genetics (DNA makes RNA makes Protein), with significant implications for notions of inter and intra-generational responsibility and biographical time regimes. The incorporation of 'things social' into medical domains is being taken to a new level of significance, fuelled by a number of fundamental shifts in medical reasoning and practice. The social sciences' current focus on (epi)genetics can only be a starting point for a broader interdisciplinary agenda to better understand the pathways through which 'the social and cultural' enters the body."[7]

The idea that environment (nurture) does impact genetics (nature) is the basis for the development of the field of epigenetics by two iconoclastic scientists. Their stated mission was to find out what is really at the heart of this interaction.

"Together, they discovered that our genetic code, the actual sequential structure of our DNA, can pretty much shrug off the influence of any external environmental factors, short of massive radiation. However, the expression of individual genes within that sequence can be permanently altered by such seemingly innocuous influences as diet or how others treat us. Once triggered, a group of molecules called a methyl group attaches itself to the control centre of a gene, permanently switching on or off the manufacture of proteins that are essential to the workings of every cell in our body. In most tumours, this DNA methylation pattern has been knocked awry, leading to a gene being completely deactivated or triggered to abnormally high activity.

"Now, scientific evidence is emerging that these externally driven changes in the behavior of our genes might be passed down through the generations. For example, recent research has demonstrated that the sons of men who began smoking before puberty were more prone to obesity. All of a sudden, we're staring personal responsibility in the face. Not only can our bad habits or noble attempts at clean living permanently change the way our genes act within us, they could very well have a significant impact on the quality of our children's lives."[8]

This also contributes to a reconsideration of an old view of evolution proposed by Lamarck and discredited over the years as Darwin's ideas of natural selection took hold. It proposed that individual efforts during the lifetime of the organisms were the main mechanism driving species to adaptation, as they supposedly would acquire adaptive changes and pass them on to offspring. A propo-

"Both beekeeping and bee research just got a lot more complicated."

nent was Ivan Pavlov, who claimed to have observed similar phenomena in animals being subject to conditioned reflex experiments. He saw that with each generation, the animals became easier to condition.[9] So-called NeoLamarckism has been given impetus with discoveries of epigenetic phenomena. But although the reality of epigenetic inheritance is not doubted (countless experiments have validated it) the significance to the evolutionary process remains uncertain.[10]

Returning to honey bees as noted in the first part of this article, their genome is much like that of vertebrates. In addition, their sociality is highly developed and there is already evidence that the haplo-diploid situation with regard to the "battle of the sexes" fits with epigenetic theory All this points to the fact that the effects of epigenetics cannot be ignored when beekeepers manage or scientists study the honey bee. Genetic analysis of Apis mellifera is no longer just about the genome. Epigenetics and the resultant epigenome must be taken into account as well. Both beekeeping and bee research just got a lot more complicated. BC

Dr Sanford is a former Extension Specialist in apiculture at the University of Florida.

References: (All URLs accessed February 12, 2008).

1. http://www.ehponline.org/members/2006/114-3/focus.html
2. *Ibid* http://www.ehponline.org/members/2006/114-3/focus.html
3. http://www.hopkinsmedicine.org/press/2002/November/epigenetics.htm
4. http://en.wikipedia.org/wiki/DNA_methylation
5. http://www.hopkinsmedicine.org/press/2002/November/epigenetics.htm
6. *Ibid.* http://www.hopkinsmedicine.org/press/2002/November/epigenetics.htm
7. http://journals.cambridge.org/action/displayAbstract;jsessionid=C8C18928CA89AC89F865161D22D395E2.tomcat1?fromPage=online&aid=446742
8. http://www.mcgill.ca/headway/fall2006/indepth1/
9. http://en.wikipedia.org/wiki/Lamarckism
10. http://en.wikipedia.org/wiki/Lamarckism#Neo-lamarckism

An "Instant" Fence!
against predators

Photos from Wehr Honey Farm in Keota, IA.

Protect from bears

ElectroNet™ 9/35/12
- Easy to install
- Quick to move
- 35″ tall

(large photo) An electrified fence with posts already built-in. To install, just unfold it. Set the posts by hand. Effectiveness proven by years of use worldwide. Also works for livestock.

Protect from small predators

VersaNet™ 9/20/3
- Controls possums, skunks & raccoons
- 20″ tall

(inset photo) Same ease of installation as 35″ ElectroNet. Also great for garden use.

Both nets create an impenetrable mesh when electrified.

Ask for our fence booklet— it's free!

Free Shipping
Visit our website for details.

PREMIER 1

800-282-6631
www.premier1supplies.com
Washington, IA

The Cape Bee Of South Africa

Mike Allsopp

There is considerable debate as to why the extra-limital movement of Cape honey bees in South Africa in 1990 gave rise to the "Capensis Problem" when previous similar excursions in Southern Africa (in 1910, 1927, 1975, 1977, 1984 and 1985) had failed to do so. One explanation is that only a particular, rare subset of Cape honey bees are capable of extreme social parasitism, and that the 1990 event included this subset whilst previous events did not. Some researchers have gone so far as to suggest that this has resulted in an incipient speciation event, with a new species of Cape honey bees being in the process of emerging. The alternative explanation is that all Cape honey bees are capable of social parasitism and that it was only the scale of the 1990 event that resulted in the massive problem witnessed in South Africa since 1990. All the previous events involved the extra-limital movement of small numbers of Cape colonies, normally for research purposes, and in these instances the problems that developed were soon contained and the Cape bees soon eliminated. Only in 1990 were a substantial number of Cape colonies translocated, and only in 1990 did these colonies enter commercial beekeeping operations.

Which ever explanation is correct, it is self-evident that it is not a good idea to move Cape honey bees beyond their natural boundaries. It is not widely known that the America's could very easily have had a Capensis Problem instead of an Africanized bee problem. In 1957 when Dr Kerr took *Apis mellifera scutellata* to Brazil, he also took a batch of Cape queens, and he suffered the same social parasitism and colony takeovers that are now so well documented in South Africa. Mercifully, it seems that the Cape bees were in an isolated spot and that the problem colonies were able to be eliminated. But it could have been so different. European beekeepers and researchers also have a long history of taking Cape bees to Europe, for study and adventure, and localized Capensis Problem events have occurred there as well. In all cases these were short-lived, seemingly terminated by the onset of Winter, as Cape bees (like other African bees) do not form Winter clusters and are unable to survive prolonged cold spells. It might be expected, however, that Cape honey bees could readily survive in Mediterranean climates, perhaps in Spain or Greece, and it seems a pretty big gamble to take.

As amazing a bee the Cape honey bee is, and as much a "normal" honey bee it is on home turf, it can only be a very bad idea to move it, for any purpose, from its natural distribution at the southern tip of Africa to anywhere else in the world. BC

Mike Allsopp is with the Agricultural Research Council, Stellenbosch, South Africa.

The 'How' Of The Capensis Problem

In the honey bee world, and in those of other social insects, the queen pumps out eggs, while those in worker castes are sterile, and live merely to raise her offspring.

But in many species of bees, female workers lay unfertilised eggs, which, if allowed, will hatch into male bees. This behaviour is frowned upon, and "police" workers destroy many of these illicit eggs.

Cape honey bee workers, however, can spawn females through parthenogenesis, also known as virgin birth. If the larva receives the right coaxing – including a diet of royal jelly – it will develop into a queen, genetically identical to the lowly worker. That queen, and her offspring then can take over a colony of *Apis mellifera scutellata*, turning it into a colony of *Apis capensis* – commonly called The Capensis Problem. Otherwise, worker cape bees enter a *scutellata* colony and become laying workers, producing only drone cape bees. The future of that colony is then doomed, unless a virgin queen is produced. Either way, the *scutellata* colony no longer exists.

To determine the prevalence of worker reincarnation, the research team analyzed the DNA of Cape honey bees from seven colonies in South Africa.

Surprisingly, nearly two thirds of the queens led previous existences as workers.

To distinguish between natural born queens and the reincarnated kind, the researchers swapped queens between hives. This way, the queen's eggs were genetically distinct from her workers' sneakily laid eggs.

The researchers also discovered that most of the reincarnated queens – 15 out of 23 – were the offspring of worker bees from another hive. The foreign bees fooled the workers into coronating their eggs.

"By deciding not to police and not to remove worker-laid eggs, you are leaving the door wide open," said Sumner, one of the research team.

The study is published in Proceedings of the Royal Society B. (ANI)

The Capensis Problem arose when typically black Cape honey bees got into typically yellow Savanna honey bee colonies.

In queenright non-Cape colonies, Cape workers readily become laying workers, exhibiting a typical flighty, extended-wing posture.

In non-Cape colonies Cape larvae are fed disproportionally, giving rise to "super-cape" workers.

Using The Warré Hive

Sustainable, Bee Friendly Beekeeping

David Heaf

Background

The media has featured honeybee health more than usual lately, largely because of colony-collapse disorder Tests on honey show that some beekeepers routinely treat colonies with antibiotics. The worldwide spread of *Varroa* has forced beekeepers to dose hives with acaricides. Relatively recently in the history of beekeeping, bee disease bureaucracies were set up at public expense.

This small selection of bee health phenomena justifies the question: is modern framed-hive beekeeping, spanning little more than a century out of some three millennia of beekeeping, laying the foundations for its own demise?

In case it is, I describe here a bee-friendly way of keeping bees that is arguably healthier as well as being more sustainable in the broadest sense of the term. I hope to encourage readers to experiment with it – as I am doing alongside my framed hives – and to form a network to exchange experience.

I started beekeeping in 2003 with five 11-frame hives and by 2006 had covered my start-up costs for 20 hives and all equipment. I was just considering starting a top-bar hive experiment when a friend interested in 'bee-appropriate' (*wesensgemäß*) beekeeping sent me a copy of chapters from a book which describes the hive of Abbé Christ (1739-1813).[1]

The main message in that article is that *Nestduftwärmebindung*, i.e. keeping in place the scents and heat of the brood nest, is absolutely essential for optimal colony health. Wild and skep colonies have this characteristic through the sides and top of the combs being fixed to the walls. Inter-comb cul-de-sacs, opening at the bottom, allow the controlled ingress of fresh air, the discharge of CO_2 and the maintenance of optimal heat and humidity in the nest. The integrity of the almost closed cavities is essential for creating a 'germ-free' atmosphere in the nest. By contrast, hives with so-called moveable frames constantly thwart the bees' efforts to maintain nest integrity, mainly by letting out the nest atmosphere and heat into voids above and beside the frames, and into supers. This stresses bees, increasing honey consumption and disease risk.

Intrigued by the article's arguments, I decided to experiment with its beekeeping concept. The same friend said that the modern equivalent of the Christ hive is that of Abbé Emile Warré (?-1951) and sent me plans of it, which, however, were by Jean-Marie Frères and Jean-Claude Guillaume from *L'Apiculture Ecologique de A à Z*, not by Warré himself.[2] Their book has a wealth

Warré hive body/box.

View through a hive body window.

An acrylic Warré hive with casing removed. (Marc Gatineau photo)

Gatineau fork-lift for Warré hives.

Artificial swarming from a National brood box shortly before removing the National: the brood with an advanced queen cell is above and the queen and field bees are in the Warré hive. In between is an adapter board and queen excluder.

of meticulously illustrated practical detail about Warré beekeeping, and their hive differs mainly in that each hive body has a shuttered window. I made some of these hives in the Winter and populated six of them in Spring/ Summer 2006.

Wanting fully to understand Warré's original beekeeping concept, I read his book *L'Apiculture pour Tous.*[3] As it was well worth translating, if only to have handy for quick reference, Pat Cheney and I translated it and published it as 'Beekeeping For All' on the Internet.[4]

Warré's beekeeping concept

In his book, Warré recounts:

"Each Winter, all my childhood friends ate an abundance of delicious bread and honey, just as I did. Twenty years later, I was the only person who had beehives. In some gardens, there was an abandoned Dadant or Layens hive, empty of course. The owners had let themselves be tempted by the advertisement of some on displays at agricultural shows. They believed they would do better with these modern hives. In fact they abandoned the only hive that suited them. At my parent's home there was always plenty of honey for masters and workers, even for the farmyard animals. All our friends in the village also had their share each year" (Ref. 2, pp. 35 & 37)

But Warré regarded harvesting honey by sulfuring the bees as barbarous and thus did not advocate returning to 'skeppism' Instead, he sought a system that was just as simple and economical as skeppism so that bees would once again be commonplace in gardens. The ideal hive had to be easy to construct by anyone with elementary woodworking skills. The annual management had to require little time, be easy and need minimal and inexpensive equipment. The bees had to winter on their own honey, yet leave a reasonable surplus for the beekeeper The method had to give rise to docile bees so that people would not be fearful of starting beekeeping.

Construction

A Warré hive is a tiered top-bar hive comprising a stack of at least two boxes each of internal dimensions 300 x 300 x 210 (deep) mm with eight 8 x 24 mm top-bars at 36 mm centres. The floor, a plain board, is notched to form a 120 mm wide entrance and has an alighting board nailed underneath. The internal dimensions of the box resulted from long research involving the construction of some 350 hives, but are essentially developed from features, such as cavity size and shape as well as the number and dimension of combs, embodied in the hives of Abbé Voirnot and Georges de Layens.

The box walls are at least 20 mm thick; mine are 25 mm. The top-bars rest in 10 x 10 mm rabetts, but, to ease construction, can just as securely rest on battens nailed 10 mm below the box rim. The bars have a bead of wax or starter-strip fixed to the centre line of their rough-sawn undersides and a film of linseed oil on the planed upper surfaces. My first boxes had unnecessarily robust jointing. Warré recommends simple butt jointing fixed with nails. Each box has ample, firm handles.

On the top box rests a layer of coarse-weave hessian sacking stiffened with flour paste. Above that is a 100 mm deep box, the *coussin* which we have translated as

'quilt', as this term conveys its function better and is not unfamiliar in hive construction. The underside of the quilt is covered with sacking and the top left open. It is filled with natural insulating material such as wood shavings, sawdust, straw or dried leaves. Apart from its insulating function this helps control humidity through absorbing excess moisture onto the large area of hydrophilic surface. This probably has a humidity buffering function. There is no condensation in Winter

On the quilt is a wooden ridged roof containing a board to keep mice out of the quilt and a ventilated cavity, which not only reduces solar heating of the top of the hive but also, so I am told, prevents the roof lifting off in strong winds. For various reasons, my first batch of roofs were on a conventional, not Warré, hive pattern, i.e. flat, containing a cavity ventilated in four directions and covered with recycled sheet aluminium. There are two arguments against this pattern. One is that sheet metal has a high carbon footprint and therefore violates a criterion of sustainability The second is that, according to Warré, the drumming of rain on flat metal-clad roofs disturbs the bees.

Warré discovered that the hive body height of 210 mm under the conditions of natural comb development is crucial to the ease of separation of the boxes at harvest. The square box and tall, narrow format results in a brood nest whose dimensions correspond closely to a natural swarm when suspended, and, in approximating to a cylinder, is thermally efficient compared with most modern hives. The unit is reminiscent of a hollow tree with the quilt forming a roof with a thermal conductivity not too unlike rotting wood.

Management

Basic management needs only two visits a year and on only one of these is the hive really opened. A swarm or artificial swarm of at least two kg is introduced at the start of the main nectar flow and, if necessary, fed with diluted honey from the same apiary. Three boxes can be given at the outset to save adding another later

If windows are used, comb growth can be monitored without lifting the hive, otherwise windows are of little observation value, increase the hive's carbon footprint and reduce its cost advantage.

Comb growth starts in the top box, continues as far as a bee space above the top-bars of the box below and resumes under the bars. An artificial swarm I hived on 26 April 2006 extended to three boxes by September, similar to the situation shown.

In a good season, further boxes may have to be inserted underneath. If an assistant is not available, this can be done with a simple fork-lift.[5] Mine was made mostly of scrap, but there was no escaping the £20 outlay for the pulleys and cord. Note that inserting boxes does not involve opening the hive, i.e. does not let the heat out. I have inserted boxes on busy foraging days without needing smoke. The bees seem wholly unconcerned, although Warré recommends smoking the hive entrance at every intervention.

The real hive opening occurs only at harvest, in my locality in Wales in late August or early September The top box is gently loosened with the hive tool. The roof, quilt and cloth are removed and the bees smoked down into the box below. Any wax bridges to the top-bars below are sheared by gentle rotation of the box in both directions and the underside of the comb is inspected for brood. If there is no brood the box is taken for harvest by draining or pressing the comb. If the hive has extended to four boxes, the next box can be examined and removed in the same way provided that 12 kg of honey and two boxes are left for Winter· the upper box with mostly honey and the lower with mostly comb and a diminishing brood nest, not unlike a more modern two-story colony The rim and top-bars of the upper box are scraped clean, a new cloth fitted, the contents of the quilt renewed, the quilt and roof replaced and a mouse guard affixed for wintering.

In Spring, the mouse guard comes off, a clean floor is substituted and a fresh box added underneath the two that overwintered. That is all.

Mobility of combs

Unlike in skeps, this hive is designed for removing comb if the beekeeper wishes. This is particularly important in countries where beekeeping legislation does not allow honey bees to build a bee-appropriate nest, i.e. to fix their comb to the sides of the hive, the importance of which is described above. But as with all top-bar hives, much greater care is called for when removing comb, because the comb attachments to the walls have to be cut with a thin, serrated knife and the comb, fixed to the top-bar, kept vertical at all times. Warré commented on the so-called moveability of framed comb and pointed out that cutting through the comb bridges in his hive was easier than unsticking propolised frames. Another

"I advise anyone about to experiment with the Warré method first to read at least the parts of 'Beekeeping For All' that deal with hive construction and management"

advantage of removing comb is to have some drawn comb spare for the various standard beekeeping manipulations. Accordingly, Warré describes a simple adapter cage for extracting honey from unframed comb in a tangential extractor However, reusing comb is not done to the extent that it significantly undermines the brood nest renewal process that is built into the Warré hive concept.

Roger Delon introduced a modification of the Warré hive by inserting a three mm thick stainless steel wire in the top-bars so as to pass round the three remaining edges of the comb. This wire is essentially 'invisible' to the bees in that, unlike with wooden frames, they still create a natural nest with comb touching the walls. Although this counters Warré's aims of simplicity and cheapness – and stainless steel has a high embodied energy – it might be an acceptable temporary help to comb mobility while legislatures are catching up with the ideas of bee-friendly beekeeping.

Swarm control

Most of the manipulations of beekeeping are possible with a Warré hive but only one additional manipulation is mentioned here, namely Warré's 'pioneering method' of swarm control. At the start of the main nectar flow, whether or not hive entrance 'beards' or other phenomena warn of incipient swarming, an entire colony may be artificially swarmed into three fresh boxes, the old brood destroyed, the honey harvested and the wax rendered. A colony with no brood to hold it back generally develops very rapidly and usually gives a honey surplus.

***Varroa* control**

Frères and Guillaume recommended that, in combination with the pioneering method of swarm control, the colony spends a short time hanging in a decontaminator box fitted with a fluvalinate strip. With *Varroa* developing resistance in our region, this is no longer an option. Some Warré beekeepers put Apilife Var®, in their hives. This risks undoing the whole point of Warré beekeeping, namely letting the bees maintain their health by suitably structuring their home. Reports that Warré hive mite counts are about one tenth those of framed hives in the same locality still need to be verified scientifically. However, several beekeepers are letting their bees co-evolve with *Varroa* without chemicals, so I am risking my six colonies that way, at least until the 2008 season, to see how things develop.

GloryBee®

Candle Making Supplies

• Molds, Wicking, Wax Equipment, Packaging, and more!

• Fast Shipments, Friendly Service

Ask for our free 108 page catalog

www.CandleMakerSupplies.com • Eugene, OR 97402 • 800-456-7923

Warré's aims achieved

The Warré hive is easy and inexpensive to make. The management time and effort is relatively very little. The equipment required is minimal: a centrifugal extractor is not required, although, if you have one, Warré gives precise instructions for extracting comb. The bees winter on their own honey Sugar is fed only in emergency. Warré found that the bees, left almost entirely in seclusion, as indeed befits them, became so docile that he could work his hives veil-less with his spaniel sitting at his feet. A commercial Warré beekeeper corroborates the docility [6]

Warré and other beekeepers have proved that honey from such hives is cheaper to produce than that from framed hives. The brood nest is constantly moving down onto new comb, therefore healthier The bees themselves determine worker cell-size and drone cell numbers. There is always plenty of space under the comb for wax makers etc. so swarming risk is reduced. It is natural, organic, bee-friendly, sustainable beekeeping.

More details of this experiment can be found on my Warré page (on a botanist friend's website) which includes links to Warré's book and to web sites of all the German and French Warré initiatives known to me at the time of writing.[7] I advise anyone about to experiment with the Warré method first to read at least the parts of 'Beekeeping For All' that deal with hive construction and management. Anyone needing advice on Warré beekeeping or interested in forming an English language email discussion group for it is invited to contact me. BC

You can contact Dr David Heaf at 101622.2773@compuserve.com.

References

1. Thür, J. *Bienenzucht: Naturgerecht einfach und erfolgsicher.* 2nd ed. Friedrich Stock's Nachf. Karl Stropek (Buchhandlung und Antiquariat), Wien, 1946. (Available on Bernhard Heuvel's sustainable beekeeping website: www.selbstversorgerforum.de/bienen/bienenindex.html).
2. Frères, J-M & Guillaume, J.C. *L'Apiculture Ecologique de A à Z* (Villelongue-Dels-Monts, 1997) Ordering details at www.ruche-ecologique.org/ Currently available only as a bound printout, but a publisher is now working on a new edition and it will also appear in English.
3. Warré, E. *L'Apiculture pour Tous* 12th edition. (Saint-Symphorien, 1948). Downloadable free at lo.gui.free.fr/apiculture/apiculture.php/200-apiculture.html.
4. Warré, E. Beekeeping for All. Trans. Heaf, D. & Cheney, P. (Llanystumdwy, 2007) Downloadable free at www.mygarden.me.uk/beekeeping_for_all.pdf.
5. Gatineau, M. *L'apiculture, telle que je l'aime et la pratique* (Serres, 2006). Ordering details www.apiculturegatineau.fr.
6. www.ruche-warre.com
7. David Heaf's Warré page: www.mygarden.me.uk/ModifiedAbbeWarreHive.htm

NATURAL REMEDIES - Part I

Products From The Hive For Health, Beauty & Energy

Abbas Edun

You are the person responsible for your health. It is your obligation to inform yourself about matters of health and medicine, to seek information of value and to make use of it for the benefit of yourself and your family

This article seeks to bring to your attention honey bee products in the hope that they will enhance your health, vitality and beauty Those products are among the most remarkable and versatile nutrients in the world.[1] A wide variety of compounds found in those nutrients are inimitable and not reproducible in the laboratory using organic synthesis.

Meaning and history of apitherapy

The term apitherapy[2] was once used to denote healing by means of bee venom therapy (BVT) alone, but it is not now confined to such use. It comprises methods of treatment by means of the whole range of organic substances produced in the hive, instead of applying synthetic medicine. The products other than venom are honey, pollen, bee larva, beebread, beeswax, mead, propolis and royal jelly A special synergy is achieved when taking the first two and the last two of those products in combination.[3]

The honey bee was held in high esteem by many ancient civilizations; it was acclaimed as a symbol of industry and fertility Products of the hive were used not only as food of the highest quality but also as remedies for certain diseases. Mention is made in ancient Chinese literature[4] over 2,000 years ago of the medicinal use of products of the hive.

The curative value of BVT was known to Hippocrates.[5] He called it "arcanum – a very mysterious remedy" and refers to it in his eight books on medicine. Galen[6] and Pliny the Elder[7] in his "Naturalis Historia" also wrote about using BVT The Emperor Charlemagne[8] is said to have been relieved of arthritis and gout by using the aculeus (sting) of the bee. It was thought at that time that the sting cured all sorts of maladies and there was a lot of faith in the venom's healing properties.

The ancient Egyptians were aware that bee stings had beneficial effects and started using the venom as a healing substance. They applied the stings directly to the affected area to treat rheumatism.[9] A mixture of honey and crushed bees was rubbed into the scalp as a cure for baldness. The importance of BVT is reflected in the following proverb of Publilius[10] Syrus: "Pro medicina est dolor dolorem qui necat," – "The pain that kills pain acts as a medicine." The Tsar of Muscovy,[11] who was suffering from polyarthritis, used bee stings to relieve pain.

As long ago as 1850, doctors in England, France and Germany reported in reliable scientific papers their positive results when treating rheumatism with BVT In 1859, Dr Desjardins of France published the first such paper in L'Abeille Médicale (The Medical Bee Journal) describing his bee sting procedure, which he said he had applied successfully to all types of rheumatism. He also reported two cases of skin cancer which he was able to cure. In 1864, Professor M.I. Lukomsky of the St. Petersburg Imperial Forest Institute, Russia, published an article on the therapeutic effect of bee venom in the "Courier Medical."

The modern study of BVT was initiated through the efforts of Dr Philipp Terc.[12] In 1879, he became interested in it when he was accidentally stung and cured of several arthritic conditions. He was the first physician to apply bee stings in a systematic way to the treatment of rheumatism in his patients. His first publication[13] on the subject appeared in the Vienna medical press in 1888. Although ridiculed by the orthodox medical profession throughout his career, he reported that during a quarter of a century he had applied 39,000 stings to about 500 rheumatic patients without side effects, a complication or a fatality Dr Terc ascertained that most patients with conditions that responded to BVT were not as sensitive as healthy persons to the adverse effects of bee stings.[14]

Conventional BVT involves the application of bee stings to the affected area of the patient over a period of time. Gradually the number and frequency of stings are increased until desensitization (immunity to them) is achieved; maximum anti-arthritic benefits are then experienced. In 1928, Dr Franz Kretschy of Vienna practiced envenomation, a process

which involves the injection of a solution of the venom extracted from bee stings. The development of this method meant that patients no longer had to endure the painful stinging process, as the venom was available for subcutaneous injection.[15] It was obvious that the recognition of BVT which Drs. Terc and Kretschy sought, and for which they worked so hard for many years was not, at that time, forthcoming in the United States.

Dr. Bodog Felix Beck[16] used BVT from 1935 to 1941. His work ceased during World War II and then the discovery of cortisone[17] diverted attention from BVT However, some of his students and a few others kept his interest alive. Dr. C.B. Warren started funding some research on domesticated animals with good results.

Charles Mraz,[18] a beekeeper and an acquaintance of Dr. Beck, brought the natural benefits of BVT to thousands of individuals. He treated patients with autoimmune diseases,[19] particularly arthritis and multiple sclerosis (MS) for more than 60 years. His book "Health and the Honeybee" is highly readable and very thought provoking. It is autobiographical and illustrates his initial skepticism of, and subsequent devotion to BVT Much of the book deals with its healing process and a clear description of his methods is provided. Many cases in which bee stings were apparently successful in the relief of ailments are discussed.

Some of the most outstanding research into BVT was done in the Soviet Union. Recently, American researchers have expressed interest in it, especially since there is an enormous amount of support on the part of the public. As the 21st century approached, the medical profession began investigating BVT, studying its use at a pharmacological level. Though clinical studies had commenced by 2000, most people using BVT were still doing it themselves or with the help of lay practitioners.

The next installment in this series covers bee venom and honey. There will be several more articles in this series on *Products of the Hive. Stay tuned.* BC

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

References:

[1]Most claims of the efficacy of those products have not been proved to the scientific standards of evidence-based medicine and are anecdotal in nature.

[2]It is uncertain how long the word has been in use or who conceived it. It is derived from the words *apis* (Latin) and *therapeuein* (Greek). The former means bee and the latter a method to treat humans or animals for different diseases.

[3] See Elkins, Rita. 1996. *Healing from the Hive: Royal Jelly, Bee Pollen, Propolis and Honey.* Woodland Health Series.

[4]The Yellow Emperor (Huang Di) and the Fire Emperor (Shen Nong) are said to be the founders of traditional Chinese medicine (TCM). It is believed that Di lived to the age of 110 years. His Medicine Classic was the Di Nei Jing. Shen Nong is the equivalent of "distinguished doctor," or "divine farmer" and "heavenly husbandman." His Herbal Materia Medica states that bee products "treat evil influence, supplement the insufficiency in the five visceras, help qi and mend the heart."

[5]Circa 460-370 B.C., considered to be one of the most outstanding figures in his field. He was revered as the father of medicine in recognition of his lasting contribution as the founder of the school which is named for him, and is credited with greatly advancing the systematic study of clinical medicine, and prescribing practices for physicians through the Hippocratic Oath.

[6]Claudius Galenus gained fame as a surgeon to gladiators, was eventually summoned to Rome to be physician to the emperor and spent the rest of his life at the Court writing an enormous corpus of medical works until his death in 201 A.D.

[7]Gaius Plinius Secundus, (A.D. 23 - August 24, A.D. 79) was an author, naturalist or natural philosopher and naval and military commander of some importance. He believed that "true glory consists of doing what deserves to be written, in writing what deserves to be read, and in so living as to make the world happier for our living in it."

[8]Carolus Magnus was born on April 2, 742 near Liège in modern day Belgium. "By the sword and the cross," he became master of Western Europe.

[9]Any pain or inflammation in and around the connective tissue structures of the body.

[10]A Latin writer (circa 85 43 BC). He was a slave brought to Rome some years before the downfall of the republic, and designated, according to the usual practice, by the country of his birth.

[11]Ivan (Vasilyevich) the Terrible, the son of Vasily III Ivanovich, grand duke of Muscovy he was proclaimed grand duke on the death of his father in 1533, and took the government into his own hands in 1544, when he was only 14 years old.

[12]Formerly known as Filip Tertsch, he was born on March 30, 1844, in Praporiste, Bohemia, Czech Republic. He was so highly regarded by the BVT fraternity that his birth date was designated as World Apitherapy Day, an event intended to enhance international understanding of the therapeutic use and health benefits of products of the hive.

[13]"Report About a Peculiar Connection Between the Bee Stings and Rheumatism."

[14]It may be noted that this phenomenon occurs with the use of high doses of vitamin C for therapeutic purposes, also.

[15]The subcutaneous tissue or subcutis is the layer of tissue directly underlying the cutis. With a subcutaneous injection, a needle is inserted just under the skin.

[16]Beck was born in Budapest, Hungary in 1871. Dr. Beck's classic work, "Bee Venom Therapy, Its Nature and Effect on Arthritic and Rheumatic Conditions" will serve as an invaluable guide and inspiration for years to come. It was first published by the Appleton-Century Co. in 1935, and later reprinted, with a foreword by Charles Mraz and a few references to more recent progress in BVT He died in New York City on New Year's Day 1942 at the age of 70.

[17]One of the hormones secreted by the cortex of the adrenal gland. Cortisone was first (a) intensively studied by Dr. Tadeusz Reichstein (1897-1996) of Switzerland in the thirties, (b) synthesized by Dr. Lewis Hastings Sarett (1917-1999) of Merck Co. in 1946, and (c) tested on human patients by Dr. Philip Showalter Hench of the Mayo Clinic, Rochester, Minnesota in 1948. Doctors Hench (1896-1965), Reichstein and Edward Calvin Kendall (1886-1972) shared the Nobel prize (medicine) in 1950 for research on suprarenal cortex hormones.

[18]Mraz was born in 1905 in New York City and died on September 13, 1999. In 1992, he was named by the American Beekeeping Federation as one of the five most distinguished beekeepers in the United States. Charles was a founding member and Executive Director of the American Apitherapy Society (AAS).

[19]According to the American Autoimmune Related Diseases Association, "the term 'autoimmune disease' refers to a varied group of more than 80 serious, chronic illnesses that involve almost every human organ system. In all of these diseases, the underlying problem is similar, the body's immune system becomes misdirected, attacking the very organs it was designed to protect."

Wal-Mart Won't Sell My Honey

Light, dark, crystallized or not my honey is authentic food, available directly from its source.

Gwen Rosenberg

As a person who enjoys cooking and baking there are times that I must refrain from using my dough hook as a lethal weapon against well meaning but clueless friends and family. There is nothing more deflating than spending 12 hours confined to the kitchen only to have some yeast-for-brains tell me that my meal was "restaurant quality " It's a shame to ruin a whisk but honestly it takes some real work beating it in to people's heads that my food, my labor and my energy does not compare to Bob Evan's. That guy's not even in my league. Take for example, last Sunday's dinner – I had an overwhelming urge to eat a hot bowl of chicken and dumpling soup with a big, soft dinner roll. It's not an extraordinary meal, but hey, it was cold out. I then spent the next five hours making stock, peeling vegetables, kneading dough and coordinating everything to be ready before my husband and kids gnawed a hole through the kitchen door It turned out great, if I do say so myself, the soup was a hearty combination of fresh herbs, large chunks of vegetables and chicken- the dumplings were fluffy, little pillows. It was perfect, exactly what I imagined it to be. My back was sore from standing, and the rings on my finger were crusted over with raw dough but it was well worth the hours.

Good enough to be served in a restaurant. Is that restaurant quality? Is my Sunday dinner restaurant quality? Let me get this straight, the food I prepared from scratch is restaurant quality? Do you sense a bad impersonation of Robert DeNiro from "Taxi Driver" coming up? Let's examine what exactly that means before I tell you how this has anything to do with bees.

Allow me to describe restaurant quality. Now imagine Bob Evan's place. I mean the chain restaurant in the strip mall, across the four lanes of traffic and the turn-only lane, adjacent to the high voltage power lines between the car wash and the Applebees. (Spare me the "down on the farm" crapola, unless he's farming asphalt.) Three times a week a big road dirty semi-tractor trailer pulls up to the rear entrance and offloads into the hands of a pimply faced 19-year-old kid, a big white bucket emblazoned with the name of a certain massive food factory conglomerate. The top of the bucket, which is sealed on by machine and must be removed by a box cutter, is labeled "chicken and dumplings." Beneath that is a list of about three hundred ingredients, only 10 of which our teenage sous chef can actually read, followed by the words READY TO EAT DO NOT DILUTE in bold black type. Other buckets, too, are strenuously wheeled into the kitchen and they have different labels – one for every homemade soup on the Bob Evan's menu. The same pimply faced kid cuts the thick plastic tab, peels back the plastic and unceremoniously dumps the entire contents into a gigantic stock pot on the stove. Voila! Dinner is served. The beef and gravy, the stir-fry, the chili, heck, even the warm from the oven blueberry muffins all arrive the same way, bucket to plate after a brief reheat. I don't generally have much use for semi trucks, box cutters or buckets when I cook. I'm not especially flattered when people compare my meals to dinner at Bob's or Applebees or any of the other soulless, builders-grade food choices up and down strip mall America.

> "Appreciate and promote honey based on its merits as a pure food that captures a single season and may never be recreated."

This country has some strange obsession with factory made food that I just don't understand. Historically anytime someone created a machine that manhandled our food in exactly the same way over and over it was heralded as the greatest thing since production-line, preservative laden, identical looking, plastic wrapped, sliced bread. People appear willing to sacrifice the obvious difference in quality in exchange for uniformity and that's just too bad. I don't even think most people realize the unfortunate trade-off they've made. Now it's too late to go back because it will scare the children if they see unprocessed foods in their original raw state. Don't believe me? Try giving a dirty carrot fresh from the garden to a kid whose only ever seen "baby" carrots from a plastic resealable bag.

Of course there is one last food frontier that hasn't completely sold out to the big food industry although it is beginning to. Honey is probably the last remaining vestige of a bygone era where you could buy real food. Small scale beekeepers can still hang a homemade sign advertising honey for sale. I can sell my few jars and you can sell your few jars to passers-by who just want pure honey, locally made by honey bees, bottled and sold by their humble "keepers." This is as raw as it gets. This is genuine food in it's original state and is as recognizable to us as it was to early civilizations (minus the cute little bear shape bottle). It is the farthest thing from restaurant quality Restaurant quality honey more closely resembles caramel colored corn syrup sold in little ketchup packets. Restaurant quality is the crystalline syrup manufactured by huge food companies for uni-

form flavor, color and profit margin. Beekeepers do not make restaurant quality honey. Nor should we ever strive to. We should revolt against anything that encourages our honey houses to turn into little Syscos or ConAgras or U.S. Food Corps. Honey that is sold in grocery stores and Wal-marts never crystallizes, it never has air bubbles and above all it never, ever has an errant bee leg in it. It is always called clover honey because some executive somewhere hijacked the word and redefined it to mean manufactured, cooked honey – origins unknown. It has nutrition labels and bar codes. It is all exactly the same, which I think is the most terrifying.

My honey on the other hand tastes different from season to season even in the same year It may smell like goldenrod or black locust and I swear it crystallizes before I can tighten the cap. The honey I sell has air bubbles and flecks of pollen. It is never completely uniform and the jars may be a little sticky My homemade labels are sometimes crooked and the jars I give away have no label at all – that's how you can tell I like you. Sometimes I run out of honey and customers have to wait until the next honey flow just like me. I do not have mass distribution routes and my quality control manager is a sweet toothed seven year old. My honey is not restaurant quality And neither is yours, I hope. Wal-mart can never stock my honey not because they can't pay me enough, they certainly can, but because I could never produce a zillion, or million, or even a thousand pounds of honey that tastes and looks exactly the same. I could never bottle it and transport it for what they would be willing to pay So the question there is, what are they doing different and at what cost?

Our labor as beekeepers, and the resulting honey is truly one of the last artisinal foods. We should be proud that it cannot be mass produced. The gold colored syrup stocked in discount stores is a poor imitation of our product. We can not afford to forget that. We should not have to change our product or labels to conform to the mass distributors. We should repel any effort to push us into accepting rules that have been established for major food manufacturers. Those rules were created to police unscrupulous food factories from killing us with their over-processed imitation food. We should not adopt any of their requirements because we are not beekeepers aspiring to be conglomerates, nor are we providing food that bears no resemblance to its original state.

Sure the requests appear reasonable, a label with an address and the weight, for example. Slowly, however, the requests are turning into requirements. Now I'm supposed to warn people not to feed honey to infants, should I also warn people with weakened immune systems and Spring tree pollen allergies, what about people who don't like sweets? I won't put "home produced" on my label either What benefit can that possibly have for anyone. Soon we'll need to hire regulators to evaluate our homes to be sure we're not actually using sheds or garages. Does a split-level count? What about an apartment roof top? I think that by accepting any of these labeling requirements we are cheapening our product and making it more restaurant quality, more manhandled and regulated and less like real food. Wal-mart and Target stores should label their honey as factory produced, super-heated and enhanced with additives and antibiotics. People like me and you have been harvesting honey for 10,000 years and in all that time it has remained pure raw honey Doesn't that warrant some kind of grandfather clause?

Let's focus on the honey in the bottle for a moment. Are consumers demanding that our honey look and taste a certain way? The average consumer is willing to accept just about anything that is marketed as food – just look at Arby's if you need proof. The consumer is that last person who should dictate how filtered, heated or flavored honey should be. Most people don't even know that there is natural variation in honey They don't even realize that the two pound jar in the grocery store shouldn't cost less than three dollars. I'm calling beekeepers to take back our honey, define it and label it on our terms. Appreciate and promote honey based on its merits as a pure food that captures a single season and may never be recreated. Take a lesson from the vineyards. The wineries have spared themselves from being ravaged by Dollar Store knock-offs. Suggesting that all burgundy taste and smell the same could get you the guillotine in France. Apiaries deserve the same reverence. Light, dark, crystallized or liquid, it is authentic food, available directly from its source. There is no reason we should belittle our product with extraneous labels or apologize for air bubbles or crystallization. We should not have to spend exorbitant sums on fancy bottling machinery to make it look uniform and shrink wrapped. Be proud of your classic glass jars, and indignant at the suggestion that the label include some legalize. Explain to your customers that honey, really good honey crystallizes, and that they had better stock up because there's no telling what next season's crop will taste like or when the next honey flow will be.

It is impossible to recreate the quality of food that has been made carefully in small quantities with the ingredients at hand. The quality is as recognizable in honey as it is in Sunday dinner A bee leg lends charm to a jar of honey the same way a big, olive-green bay leaf swimming in homemade chicken stew adds flavor Food this good comes only from the person who took the time to make it. BC

Gwen Rosenberg is in the kitchen, cooking with honey, in her home in Kent, Ohio.

MORE MATINGS MEAN BETTER QUEENS

More Is Always Better

Dave Tarpy

The success of the "reign" of a honey bee queen appears to be determined to a large degree by the number of times she mates with drone bees.

That is what research by scientists in the Department of Entomology and W.M. Keck Center for Behavioral Biology at North Carolina State University suggests. Dr. Freddie-Jeanne Richard, a post-doctoral research associate; Dr. David Tarpy, assistant professor and North Carolina Cooperative Extension apiculturist; and Dr Christina Grozinger, assistant professor of insect genomics, found that the number of times a honey bee queen mates is a key factor in determining how attractive the queen is to the worker bees of a hive. Their research was published October 3 in the online scientific journal PLoS ONE.

A honey bee queen mates early in her life, Tarpy explained, but usually with multiple partners, the drones of another bee colony. Richard, Tarpy, and Grozinger found that the number of partners appears to be a key factor in making the queen attractive to the worker bees of a colony – the more partners, the more attractive the queen is and the longer her reign is likely to be.

The scientists also conducted experiments that suggest that the number of times a queen mates is a factor in altering the composition of a pheromone, or chemical signal, the queen produces. It is the composition of this pheromone that appears to attract the worker bees of a hive.

A honey bee colony consists of a single queen and several thousand sterile worker bees. Throughout most of her life, the queen's job is to lay eggs. However, early in a queen's life, she makes several mating flights. On these flights, she mates – in midair – with anywhere from one to more than 40 drones. The average number of drones with which a queen mates is 12. The queen stores the semen from her mating flights for the remainder of her life, two to three years for a long-lived queen. However some queens are not so long-lived. They are rejected by the workers of the hive. The research of Richard, Tarpy, and Grozinger sheds light on this rejection mechanism.

Because queens mate early in their lives and store semen, it stands to reason that queens that have mated multiple times and accumulate more semen might be more valuable to a colony. But Tarpy said researchers have not studied the impact of the number of times a queen mates on her physiology until now.

To determine the effect mating has on honey bee queens, the scientists artificially inseminated queens. It's difficult to determine the number of times a queen mates under natural conditions. Some queens were inseminated with the semen from one drone, others with the semen from 10 drones. The scientists then put the queens in hives and observed them.

They found that worker bees paid more attention to the multiply inseminated queens. Worker bees demonstrate what is known as a "retinue response" to their queen; they lick her and rub their antennae on her The retinue response to the multiply inseminated queens was more pronounced.

"This tells us the workers can tell how many drones the queen has mated with," said Grozinger

Like many animals, honey bees use pheromones to communicate. When Richard analyzed pheromone produced in the mandibular gland of honey bee queens, she found that pheromone composition changes dramatically after queens mate and that the number of times the queen mates appears to be a key factor in determining the extent of pheromone alteration.

Richard added that when worker bees were exposed to pheromone from queens inseminated with semen from one drone and queens inseminated with semen from multiple drones, the workers showed a preference for the pheromone from the multiply inseminated queens.

Richard added that an analysis of the mandibular gland pheromone found differences in the chemical profile of pheromone from once-inseminated and multiply inseminated queens. The scientists also found differences in the two types of queens in brain-expression levels of a behaviorally relevant gene.

"Our results clearly demonstrate that insemination quantity alters queen physiology, queen pheromone profiles and queen-worker interactions," the scientists write in the PLoS One paper.

Tarpy said the research could have implications for bee breeding and for beekeepers. The research suggests that queens that mate with multiple partners are superior, so breeders may want to select for this behavior.

At the same time, beekeepers usually buy mated queens when they re-queen their hives. Tarpy said it should be possible to devise a test to determine if a queen has mated few or many times. Such a test would help beekeepers determine the quality of the queens they buy. BC

"So, how promiscuous was <u>your</u> queen? Ask your producer. Get the right answer."

Source: Public Library of Science
http://www.physorg.com:80/news111129057.html

West Virginia & HEARTLAND BEES

Dan O'Hanlon

Huntington, West Virginia
July 10-12
Bee There!

"Almost heaven West Virginia" goes the song, and this Summer you will have a chance to get that close to heaven. The Heartland Apiculture Society [HAS www.heartlandbees.com] is bringing its summer meeting to Marshall University in Huntington, West Virginia July 10-12. Huntington is convenient to reach by air or by car It is located on I-64 right where Ohio, Kentucky and West Virginia meet on the beautiful Ohio River

HAS will have more than 150 classes including three separate tracks in the beeyard. Speakers like Jerry Hayes, Dennis VanEnglesdorp, Jerry Broomenshank, Clarence Collison, Michael Bush, Jennifer Berry and Rob Mountain will teach you everything you ever wanted to know about keeping bees but were afraid to ask. But there will be much more going on for you or your family to do in the area. There will be tours of a glassblowing factory and an historic Heritage Farm Museum.

We will be showing the hit movie, 'We Are Marshall' about the plane crash that happened in 1970 and how the town pulled together to overcome the tragedy We will also be showing 'Sister Bee', a movie by Laura Tyler about women and beekeeping, and Laura will be there to answer questions. Finally, we will be showing the movie 'Pollen Nation' about industrial pollination and its implications for humans and bees. On Friday night, the Cabell Wayne Beekeepers will be hosting a Bluegrass band and Ice Cream Social featuring ice cream made with local honey

If you want to make plans to visit the rest of West Virginia you will find plenty to see and do. The entire State has six different interstate systems, meaning, from Charleston, you can reach Cleveland, Columbus, Cincinnati, Pittsburgh, Louisville or Charlotte in four hours or less ah, but once you leave the interstates, the drive becomes a thing of wonder Two lane roads, winding up and down the mountains, offer amazing views and historic places, small towns, poor in wealth but rich in history

We have the oldest covered bridge still in use. We have walnut festivals, strawberry festivals, apple festivals, pumpkin festivals, and buckwheat festivals. We have arts and crafts fairs and stern wheel regattas and ramp dinners. We have Bridge Day, on the New River Gorge Bridge over 875 feet above the New River; the only standing structure in the United States that, one day a year, allows parachuting and bungee jumping. It is the world's largest single arch steel span bridge. The view from up there is simply breathtaking.

West Virginia has white water rafting and hiking, caves and waterfalls, and camping in every direction. We have Sundays where a leisurely drive in the car can take eight hours, and only cover 100 miles. We have bed and breakfasts, and resorts, and golf courses, and museums, and the Greenbrier Hotel. This is also the location of the Atomic War Bunker built to house the U.S. government in the event of war It is a tour you will not want to miss.

West Virginia has more natural beauty and wonder than any person could ever imagine. Over 75 percent of the State is forest, much of it National Parks. The fishing is world-class and easy to get to.

In Beckley, you will find the Exhibition Coal Mine which features tours of an actual working mine. In Grafton, they have the International Mother's Day Shrine honoring the place that started that holiday And, Dad, don't feel left out because Father's Day was started in Fairmont!

Harpers Ferry features the John Brown wax museum where you can learn about the event that led up to the Civil War Talcott has the statue and story of its most famous son: John Henry, that Steel Drivin' Man. Lewisburg has the famous Lost World Caverns that will take you deep into a fascinating underground world you'll not soon forget. A side trip to Green Bank will take you to the National Radio Astronomy Observatory. There you can view the distant stars and galaxies...or just help E.T phone home.

But the thing you will remember most from your trip to West Virginia is the people. This is the place that inspired Mayberry RFD. West Virginians are good people. We care about each other We talk to our neighbors over the backyard fence. We grow tomatoes for the entire neighborhood. We turn around in each other's driveways, and yell "howdy" when we do. We sit on the porch on warm Summer evenings, listening to crickets, and watching kids catch fireflies.

So come on down to HAS this Summer, and stay a while to visit. It may just be the closest you get to Heaven all year long! BC

Dan O'Hanlon is Circuit Court Judge in Huntington, West Virginia and a long-time beekeeper there.

Fishing For New Beekeepers

James E Tew

Bee Culture is obviously a magazine that provides information about bees. People, who read *BC*, read it for beekeeping information and enjoyment. People like me write about bees for people like you. "People" are clearly a major part of this equation. There is a lot of information about bees for people to read, but very, very little information about the nature of people who read about bees.

I readily admit that I am completely unqualified to write about the personality traits of people who become beekeepers and why they choose to follow those instinctual traits, but I can't completely avoid the issue. On an average day, I work more with people who keep bees than I actually work with bees. As beekeeper numbers have steadily declined over the years, I have been forced to visit and re-visit this "people" issue. Earlier this week, I attended a meeting of interested county commissioners and county administrators who were concerned about the general bee shortage. What follows is a collage of disassociated thoughts and comments that dance around the "people" discussion. My fundamental question is, *"Why do a few people come to beekeeping, while most others remain fearful and distant?"*

A discussion of me – Jim Tew

At first glimpse, that reads arrogantly I certainly don't mean to leave that impression. Before I talk about others, I sense that I should admit that I don't even fully understand why I came to beekeeping all those years ago. How can I legitimately explore ways to entice others into beekeeping if I can't explain why I did it myself?

Somewhere around 1969 or so I took a general entomology class in undergraduate school. After some military time and while into an entomology degree program, I literally stumbled into a bee class somewhere around 1973. I went bananas for bees. In later years, after I had committed my life to beekeeping, I returned to my first entomology book and to my notes to see what I had written about bees. Why didn't I become beekeepingly passionate in 1969. In 1969, I took simple notes and made simple observations about bees. Absolutely nothing special happened, but I was formally introduced to bees and beekeeping, and *it didn't take.* About four years later, a second introduction to beekeeping struck me so forcefully that I am still involved all these years later I am that person who was unaffected in 1969, but completely consumed just four years later What changed in me and why? I don't know the answers – and I am that very person.

Unanswered question – Do some people commonly need more than one introduction to beekeeping before taking up the craft?

Back at the Commissioners' meeting

The participants at this meeting were diversified in their backgrounds and responsibilities and all were well aware of the present state of beekeeping. But make no mistake, these people were interested in beekeeping and were potentially supportive of beekeeping – *but they were not beekeepers.* They seemed to appreciate what you and I feel, but they could not feel it themselves. They had no plans to get their own hives and they certainly had no plans to take any stings. *They were there to explore facilitating us but not become one of us.* After the meeting discussion had gone on for a bit, one of the quieter participants finally admitted that she was mortally fearful of bees – all bees. I immediately reassured her that her fear was not unusual. Like it or not, most people are logically fearful of bees.

The second surprise of the meeting was how quickly the group settled on a perpetually unsettling discussion – zoning for restricting bee hive placement. Within the county under discussion, a single beehive could be kept on a lot that was, at least, one acre in size. While not being represented at our meeting, another group of administrators from a local city had implemented policies that were *not* supportive of bees. Those of us who are beekeepers were asked to explain why such city bans were implemented and how wide-spread they are. How can this fundamental fear of bees be explained to others who don't intuitively understand beekeeping? I was concerned that if we were not able to adequately explain why some cities have such bans, that the supportive group at the meeting would begin to drift away from supporting us. The beekeepers' remarks and explanations at the meeting

seemed to reassure the commissioners and the meeting progressed to other discussion areas.

Unanswered question – Why are some areas hostile to beekeeping activities while other areas (townships, counties, cities, etc.) are tolerant of beekeepers and their bees?

"My Grandmother had a beehive in the garden when I was child."

Many, many people have prior association with bees and hives but never, themselves, have owned or managed colonies. I frequently hear comments like, "My grandmother had a hive when I was child," or "My Dad had bees years ago, but I don't know what happened to them." Occasionally, people come to beekeeping because they are at a place in their lives where they remember and respect their ancestors. Beekeeping seems to be the right thing to do at that time in their lives. Is there anything our beekeeping industry can to do to find these indirectly related people? I don't think so. But certainly these people represent a source of new people. Be ready for them when they show up at your local bee meeting.

Jim Tew – again

Again, I am using myself as an example because I don't know your family situation. My three grown daughters support beekeeping – to an extent – because I am so involved in it and have been for so many years. I doubt that any of the three have seen the inside of a hive within the past 20 years. I don't know what that means. I live and breathe beekeeping, but my daughters are only interested to the degree that they support me emotionally My three sons-in-law have never seen the inside of a hive and are perfectly happy keeping things that way Am I doing something wrong? Since my daughters have had countless opportunities to become beekeepers but have never done so, I have given them their space. What else could I do?

But now a new chapter in my life has begun along with a new set of questions. I have two grandchildren (one girl, one boy) and another (unknown gender) due in a couple of months. Their rooms are decorated with bees and bee paraphernalia. They have bee books and bee toys. Clearly, they are too young to actually be around open hives, but I have driven the tractor near enough to active colonies for them to have a look. My four-year old granddaughter is fearful and uncomfortable around the hives. While she has been stung by a single wasp, she has had no bad experiences with my honey bees. (I suppose a sting is a sting.) But my two-year old grandson is the most intriguing. When I take him to my lab to show him live bees in the observation hive, he pulls back and shows apprehension. He looks away from the observation hive. He is uncertain and insecure. I have never forced either of my grandchildren to stay in the area of live bees. We have a look and we keep moving. What is the cause of their negative reactions? Is it some kind of instinct? In their daily lives, they are both consistently exposed to caricatured bees and bee-related stuff. They know all the *Winnie the Pooh* characters and they have nicely written children's bee books read to them. Yet live bees threaten them. My grandson has never been stung and has only been exposed to bees in a positive way Is this just their personality or does this reaction portend a beeless future for them? Maybe the question should be, "What is it about me?" Am I am the odd duck in my immediate family?

Unanswered question – is the propensity to passionately pursue beekeeping genetically driven?

And even stranger – both my brothers and my Dad are beekeepers. My Mother is truly allergic to stings and must carry a sting kit which she has used numerous times. Obviously, she is not a beekeeper, but like my daughters and my wife, my Mother is supportive of the bee involvement we have. Within my family, we were all introduced to beekeeping by my Uncle Auby. Does having yet another male in my bee family tree mean anything or was it just random luck that my uncle was the beekeeper and not my aunt?

Okay, okay, where is this going?

All major Ohio agencies have been reducing beekeeping programs for the past several years. The justification for these reductions is obvious. In 1978, Ohio had something like 10,000-12,000 beekeepers. Today, Ohio has about 3,500 permanent beekeepers. In 1957, Ohio registered 120,000 colonies while today Ohio beekeepers generally maintain about 15,500 colonies. We are a smaller industry so our agency support has been downsized. States across the country report similar prorated reductions. The U.S. beehive population is at about 2.4 million colonies – down from five million about 20-25 years ago. While the beekeeping industry is smaller, the pollination services our industry provides are more important than ever

The reasons for these reductions are numerous and possible topics for other articles, but within this piece, my questions concern how do we scavenge for new beekeepers? What do we look for in a new beekeeper? As an industry – both state and national – how do we advertise for new beekeepers? Is it even possible to advertise for new beekeepers?

Unanswered question – How does our industry, at the local, state, and national level, search for new beekeepers?

Introducing beekeeping to the uninitiated

The meeting I have been discussing above and innumerable other meetings I have attended throughout years past have been held to discuss ways to promote beekeeping to new people. After all this time, no standard procedure has risen to the top. Across the U.S., people seem to be introduced to beekeeping for a host of reasons and programs. If I am *very* liberal with present U.S. beekeeper numbers, roughly one person per 1,000 people is a beekeeper I suspect the ratio is less, but it's probably ballpark correct. So how is an industry as small and widespread as ours suppose to interview 1,000 people to find that single one who could become a beekeeper? Bluntly answered – we are not going to do that. We can't do that. As I described in my early account of my move to beekeeping, I didn't even know that I had an interest in beekeeping until I was a young adult. If you had asked me in 1969, I would have said, "no way" but you couldn't keep me away bees in 1973. Same man – different answers.

Without explanation some young children are drawn to beekeeping and others shy away from it, no matter what you do.

Some comments and thoughts – which may or may not be correct

1. County groups are critical to finding and recruiting new beekeepers. State groups are nearly as important. If these groups maintain high visibility at public events (fairs, garden shows, farm markets) new people will respond. Once they respond, there needs to be a program to support their new interest.
2. New people will come to beekeeping for different reasons – nearly too many reasons to list. So I am increasingly pessimistic about the possibility of developing a universal recruitment program. Beekeeping organizations should be visible, be courteous, and be consistent. Conduct organized meetings on a regular basis. Submit information and articles to the local newspaper Even if new people contact a university representative like me, I will quickly recommend that they make contact with the beekeeping organization nearest them. I can only do so much from afar
3. Primarily, people learn beekeeping from other people. Reading is great – even required – but sooner or later, a hive will have to be opened. Opening a hive is not the same as reading about opening a hive. All questions should be answered and mentors should be available to prevent new people from becoming discouraged and isolated. Bees are expensive and complicated. Don't leave new people unassisted. New beekeepers are like a new colony – fragile at first but strong later
4. Once a beekeeper does not mean always a beekeeper An individual's life and an individual's interests change over time. Indeed, an individual's health may change. While it is sad to see an individual fade from beekeeping, it is routine. I can only guess, but I would expect that the average beekeeper only stays with the craft for about 10 years.

"New people come to beekeeping for many different reasons too many to list."

Those of you committed to beekeeping

I have no science, no technical data. I have only a rudimentary background in psychology and human behavior But I would not be surprised if those of us who are committed – long term – to beekeeping do not have some fundamental, driving passion that others can only imagine. I don't know what the source of that passion is – genetic, environmental, or learned behavior I simply don't know, but I see you all the time at meetings, in the media, at county fairs, and at farmers' markets – the dedicated, consumed individuals who would keep bees no matter what the problems.

Final unanswered question – What is the driving force behind some beekeepers becoming life-long, dedicated beekeepers while other beekeepers fade?

Are we like fishermen?

Do we just put out our bait (bait = a highly visible, publicized and well organized local meeting) and wait for new people to come to us or do we, at the local level, aggressively pursue random people in random places with handouts and bee propaganda – or some such? At this time and with our current resources, I suggest that we must use the bait method. The bait method requires patience. At the local level, we can expect to get a few new people to come to beekeeping – not thousands. It would be impractical to canvass the surrounding community with information – most of which would be tossed in the trash – distributing information about local bee functions. The new beekeeper is truly the needle in the haystack. BC

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu, http://www2oardc.ohio-state.edu/agnic/bee/ http://beelab.osu.edu/

'Bout a 100 – Sideline Beekeeping

GET ORGANIZED

Self-Organization Is Essential – Working Smart

Larry Connor

You are busy Indeed, we all seem to be busy The college students at the local coffee shops in Kalamazoo sit all day complaining how busy they are, each with a laptop in front of them. For some of us, spending the afternoon over a cup of dark roast is more fantasy than reality Who has time to fritter away hours of time when there is so much to do? Retirees seem to be the worst. Maybe they know that the clock is ticking, and they only have so much more time – the fact is that we all have just so much time left, and while we don't usually know how much that is, we generally want to spend it efficiently The senior citizens among our ranks are often the folks who keep the local bee clubs organized, and tend to the political side of our state organizations.

If you have grown from a hobby beekeeper to a sideliner with about 100 colonies – or want to make that move – you suddenly realize that your 'bee thing' is taking an enormous amount of time. While you thought you would become much more efficient when you increased to a larger colony count, you find that there are days that you never even get to the 'to do' list, if you had time to write one out, but are busy filling jars for unexpected orders (which means a check may come in to pay for those supplies you just ordered that are still sitting in the kitchen where the UPS delivery person put them, unassembled).

If you need a fast and dry source of smoker material, consider this method used by Rollie Hannan in Connecticut. He places a roll of binder twine into a plastic bucket. He will keep matches or a lighter there too, plus a spare hive tool. When using twine he separates the fibers and makes a little 'birdsnest' to light the fire. Once this is going well, he puts it into his smoker and adds bundles of the twine.

(Ironically, at the very moment I am writing this, the U.S. Post Office delivered a very large package from California. It now sits in my kitchen, unopened).

So how do we raise ourselves above the banal and achieve the exceptional in terms of our organization, our efficiency and our productivity? With the strong feeling that I really should not even be writing this, here are a few suggestions that will influence our beekeeping and other efforts.

Plan and Do Local Research

Too often I am asked questions by beekeepers who have found themselves in a mess they should never even considered getting into. While some have unexpected and usually unpredictable floods, high wind, fires and earthquakes, we should avoid putting our hives directly into harm's way – right on the fault line – so to speak. Many of the problems beekeepers find themselves in are a result of their failure to plan ahead, do research and work smart when they enter a beeyard.

Conduct Careful Research – Don't believe everything you read on the Internet or are told by another beekeeper Check things out extensively, especially if you are getting started. In beekeeping it is pretty easy to pass yourself off as an expert, so be cautious while you make plans. Double-check your dimensions, your prices, your management plan and your inventory of tools and information. If you are new or relatively new, to beekeeping, you must have one or more mentors to talk with and learn from. Not all beekeepers do the same thing, and when you are doing things with your bees, ultimately it will be you who has to make the final decision on how to do things. Should you reverse hive bodies or not? If so, when? What does reversing do for the bees that they will not do for themselves? If you have been told to reverse your hive bodies in the spring, but you don't understand why you want to reverse the boxes (and not everyone believes this), you should learn that you never split the brood area so there is brood at the bottom of one hive body and at the top of the other

When I was at a Northern Vermont meeting a number of years ago I was shown some Springtime splits. There was still snow on the ground, and it was early in the season. The beekeeper had strong over-wintered hives, but when the bees were split, some of the nuclei were not given enough bees to cover the copious amounts of brood placed inside each unit. Or maybe the older bees flew back to the parent hive. Then the weather turned

cold (it always turns cold after you make splits), and the bees went into cluster The beekeeper wanted to know what was wrong with the brood, as it looked funny Actually, it was not funny, but tragic, and had started to rot. The brood was dead, killed when the bees went into cluster You could see that the center of the frames had been covered with bees, as the brood was healthy and bees were starting to emerge, but the outside parts were not based on the appearance of the brood. It was grey and the larvae and pupae inside were a funny color It was clearly not a brood disease. There was an odor, but not like American foulbrood.

Many beekeepers want to split hives early in the season to have the bees in shape for apple and other fruit bloom pollination. Well, it can be done; splitting strong hives in early April in the 40-45th parallel can be done. But there are huge risks as described above. The benefit, if it works, is that in four to six weeks the increased hive is rapidly growing and actively foraging for pollen for the rapidly expanding brood area that needs to be fed. It also means that the beekeeper has a supply of early queens. And what happens when the queen producers are delayed by poor weather? It means the beekeeper in the northern states must adjust the schedule for making splits to fit the needs of the queen producer Unfortunately, a late Spring for queen producers does not guarantee a late spring for pollination. Too often it is just the opposite!

So find out what works in your area. Since the Vermont beekeeper was in the northern part of the state, I felt his schedule was too early He did more harm than good by making early splits. A delay of one to four weeks might have produced much better results. The question gets back to ***how do you learn what works in your area?*** The answer usually means that you need to talk to other beekeepers who manage bees the way you plan to manage bees, and do this in the same area where you plan to keep bees.

I applaud and encourage bee clubs and local associations, that have strong mentor programs, where each newbee (new beekeeper) is paired with someone with a bit more experience. But if you have been a hobby beekeeper for several years, who will be your mentor if you want to become a sideline beekeeper? Most bee clubs don't support sideline beekeepers very well. It will be up to you to find out whom you can visit, call, work with and generally pester until they throw you out the door

Work Smart

My EX is a great lady and a wonderful mother and grandmother But when it came to doing some things, she was not the most organized worker Especially in the kitchen. Every holiday she made a Jell-O ribbon salad that consisted of thin layers of different colors of Jell-O that alternate with some creamy mixture in between the colored layers. Kids and old people love the salad; they pick it apart and play with the colored layers. Some eat just the clear Jell-O parts; other just eat the creamy part. It has, however, been renamed the All Day Crazy Salad because it took her all day to make it and drove me Crazy I renamed it. Part of the craziness was due to the fact that all the stuff needed to make the next layer covered every surface in the kitchen.

While this salad can be prepared in advance, it never was. The salad always seemed to occupy kitchen space

Does your honey extractor want to dance when you are not in the mood? Texas beekeeper John Knight made a concrete base for his small motorized extractor. As a 100-year old hobby beekeeper, Knight would rather go out to dinner with family and friends than dance with the extractor as it moves across the honey house floor.

when other things had to happen in the kitchen, like clean and stuff the turkey, peal the potatoes, whatever I admit that the turkey and potatoes can be prepared in advance and warmed before serving, but I nominated the salad as the most logical item on the table that could be prepared in advance. My nomination, although frequent, was never accepted.

For beekeepers, working smart means putting together nuc boxes for splits during the Winter so all the frames are checked, scraped, repaired, and correctly positioned in the nuc boxes. Then, when they are needed in the Spring, they can be loaded on the truck and taken to the out yard and made up with greater efficiency In each box, the space where the brood frames will go are occupied by frames holding foundation (as part of a comb rotation schedule), or drawn but empty comb. In addition, there is an empty frame and a food frame containing honey in the frame, saved from the past year By using a frame of honey the bees are less dependant on your feeding them sugar syrup. If the frame contains some pollen, that is

California hobby beekeeper Bob Rice keeps his hive on a small deck overlooking the bay. This provides him a solid work space behind the hive, a solid base for the hive itself. This location also lets Rice check his hive from inside the house.

Rice puts feet on his screened bottom boards (from Rubes Bees). He paints the legs with a sticky material like Tanglefoot, a material that keeps ants and other crawling critters from occupying the hive. There is plenty of ventilation under the hive during hot days. More and more beekeepers are going to screened bottom boards for varroa mite control, usually combining their use with powdered sugar treatments and varroa-resistant stock.

fantastic, but you better have a supply of the latest bee protein mix (they are changing these formulations so fast I know many beekeepers use one product because change is so scary). The frames of foundation are put into the colony for expansion. If dated with the year, you can rotate the combs out of the colony on a rotational basis.

One advantage of this system is inventory Once you have made up, say 100 nuc boxes with the frames and honey in place, that part of your job is done. When the bees are added in the field and the nucs set out, the empty pile it creates is feedback that you have done the job you set out to do. It's now time to do the next thing on your list. Or go fishing.

This is not the only way to do this. I often carried boxes of comb, honey and foundation into the out-apiary, and pulled the needed boxes to the end of the tailgate of the half-ton pickup truck. Then, as the nucs or splits were made up, the frames we needed to fill out a box were easy to find and just a few steps away If the yard is set up so there are hives on two sides of a driveway, then the truck can be moved up to the next group of colonies. Or, if the apiary is arranged in a U shape, then the truck can be backed in and centrally located so it just a matter of a few steps to get to the vehicle.

When colonies are spread out, partially covered with brush and vegetation, and on uneven ground, it is pretty difficult to work efficiently

Another part of Working Smart is to have all the supplies in the vehicle that you might possibly need. In addition to the hive tools (note this is plural), smoker with stopper (in a metal container so it is safer to drive down the street), smoker fuel, matches, queen cages, pencils, marker pens, nails, stapler, a hammer, first aid kit and of course Duct Tape. Add to this the need for moving screens, queen excluders and Well, you must have a routine checklist when you go the out-apiary because you know you will forget something.

One idea I like is to use binder twine in rolls (as put into a hay bailer), placed into a plastic bucket. A hole in the center of the lid allows the twine to pull out. When frayed and shaped into a birds nest, this twine works as a great smoker material and can be kept on the truck and will stay dry Matches can be kept in the bucket, as well as in your bee suit pocket, glove compartment, and in a secret stash in a heavy plastic bag buried under the third rock from the right in each bee yard. (You think I am joking, don't you?)

Honey House Organization – When all the hive bodies are in one place it is so much easier to load them and take them to the bees. The same is true of all equipment. Missouri beekeeper Jann Aerts color codes all his bee equipment so he can see the medium depth extracting supers and tell them apart from the cut comb supers because of the box color

Keeping combs safe from wax moths is a huge part of equipment storage. Fumigation with paradichlrobenzene will keep the moths from getting into the comb, but this must be done correctly, following the directions. If wax moths are already in the combs, then they will continue to damage the combs. While this might seem to be a simple activity, the loss of combs every year by hobby and sideline beekeepers is staggering. While it may help remove old comb from the rotation, it should be part of a plan and not random.

Handle Once – A former administrator I worked under handled each piece of paper just once. He had a support staff that let him designate each item to someone immediately I was impressed by this practice and have failed miserably to adapt its practice. True, I now strip the junk mail and envelopes at the first read of the mail, and sort any orders and checks into two piles. But this morning's piles are still on the table as I write this. It will take five seconds to put the bills into the bill drawer of my desk, and to put the checks by the computer for posting. But I did not do it.

I am always impressed with beekeepers who back up the truck and unload the truck of the day's work and then load it again for the next morning. If the entire world approached work that way our productivity would soar Instead, we often unload as we reload, and we don't always have a list to work from. It may be 10 am when we finally pull out of the drive. That is a lot of wasted time and daylight. If you are paying someone to help, are you starting them at 7 or 9:45? How many hours of paid staff time have you wasted or been inefficient with?

Sideline beekeepers face unique challenges because, by my definition, they have another job or financial support. This means that their beekeeping efforts are secondary to something else, usually another employer It makes it very challenging to be productive with beekeeping when your time is not your own. But little steps, like doing research, working smart, and handling each item only once, will increase your overall efficiency. BC

For a copy of Dr. Connor's books, Increase Essentials *or* Bee Sex Essentials, *or any other Wicwas Press titles may be purchased through the Root Company, many other supply dealers, or the Wicwas Press website www.wicwas.com. A new feature of this site is an on-line store that uses PayPal for payment.*

A Closer Look

Worse Than You Thought
DEFORMED WING VIRUS

Clarence Collison

Transmission is vertical, horizontal and venereal.

Of the pathogens that attack honey bees, viruses are the least understood because of the lack of information about the dynamics underlying viral disease outbreaks. A most crucial stage in the dynamics of viral infections is the mode of virus transmission. In general, transmission of viruses can occur through two pathways: horizontal and vertical transmission. In horizontal transmission, viruses are shared among individuals of the same generation, while vertical transmission occurs from adults to their offspring. Transmission can also occur through multiple routes in social organisms (Chen et al. 2006).

Deformed Wing Virus (DWV), formerly known as the Japanese strain of Egypt Bee Virus, is one of many viruses infecting honey bees and one of the most heavily investigated due to its close association with *Varroa* mite-induced colony collapse. This virus was first isolated from diseased adult bees taken from colonies infested with *Varroa* mites (*Varroa destructor*) in Japan (Ball and Bailey 1997). Some newly emerged bees from affected colonies had deformed or poorly developed wings. Extracts of these individuals all contained particles of a similar, unstable virus that had a distinct serological relationship to Egypt Bee Virus. Deformed Wing Virus has been detected in honey bees in Europe, Asia, Africa and most recently the Americas.

Like many other honey bee viral pathogens, DWV is usually latent and asymptomatic; in other words, the low levels of this virus that are normally found within the colony have no detrimental effect on the bees. However, when it is present at higher levels, the deleterious effects of a DWV infection include deformity, reduction in emergence size and premature mortality of infected honey bees. The virus can be found in all honey bee life stages, as well as in the parasitic *Varroa* mites (Chen et al. 2005a) and the appearance of wing deformity probably depends upon the stage at which a bee becomes infected. The virus multiplies slowly, and pupae infected at the white-eyed stage of development survive to emergence but are malformed and die soon afterwards. Infected brood may die earlier in development, but bees infected as adults appear normal until death. The detection of DWV in honey bee eggs and in larval stages, that are not normally associated with *Varroa* mite infestations suggests another possible route of transmission: queens infected with the virus may transmit it vertically to the eggs.

Deformed Wing Virus appears to be closely associated with *Varroa* mite infestations. The virus can cause mortality in colonies not infested with *Varroa* mites, but in laboratory and field studies the mite is shown capable of transmitting the virus (Ball and Bailey 1997, Bowen-Walker et al. 1999). The occurrence of deformity is associated with the transmission of the virus via *Varroa* parasitism during the pupal stage. These symptoms are normally attributed to the feeding behavior of *Varroa* mites; in light of this, DWV is considered the most prevalent secondary pathogen associated with varoosis (Yue and Genersch 2005).

The detection of DWV in individual bees and mites and the occurrence of crippled bees were analyzed from hives of differing *Varroa* infestation levels (Yue and Genersch 2005). It was found that 100 percent of both crippled and asymptomatic bees were positive for DWV, although a significant difference in the spatial distribution of the virus could be demonstrated. Analyses of the head, thorax and abdomen of crippled bees showed all body parts to be consistently positive for viral sequences. In contrast, viral sequences in asymptomatic bees could be detected in RNA extracts from the thorax and/or abdomen, but never in RNA extracted from the head. Virus replication was successful in almost all DWV-positive body parts of infected bees. In contrast, the percentage of DWV-positive mites differed between mite populations, and the virus was only able to replicate in some of the mites. Ultimately, virus replication in mites was correlated with wing deformity

The virus was also detected in the food of larval bees, implying that DWV is also transmitted by the ingestion of virus-tainted food from nurse bees.

The mere presence of DWV does not ensure wing deformity; rather, quantitative research has elucidated that it is the amount of DWV present in bees which determines whether deformity occurs at emergence (Bowen-Walker et al. 1999). Tentcheva et al. (2004) demonstrated a higher level of DWV in bees with deformed wings compared with asymptomatic bees. An analysis of DWV infection in deformed and asymptomatic workers, drones, pupae, larvae and *Varroa* mites revealed differences in viral concentrations: deformed adults

"Ideally, it would be good to obtain queens that are certified virus-free."

had the highest concentration (100%), followed by pupae (95%), mites (92%), larvae (80%), asymptomatic adult bees (79%) and adult drones (47%) (Chen et al. 2005a). The variability of virus levels may reflect the ability of different developmental stages or castes to resist DWV infection and replication.

The distribution of DWV infection within the bodies of reproductive bees (queens, drones) has recently been investigated (Fievet et al. 2006). The research showed that DWV accumulates in the digestive tract of both castes, in queen ovaries, queen fat bodies and drone seminal vesicles. The virus was detected in 67 percent of asymptomatic egg-laying queens, in 78 percent of drones collected at emergence and in 100 percent of drones collected at the hive entrance. In queens, the ovaries had the largest percentage of DWV RNA, followed by the head, digestive tract and fat body cells. The fat body cells produce vitellogenin, the yolk protein accumulated during egg maturation, so there is a possibility that DWV infection of queen adipose (fatty) tissue might impair egg production. In drones, the highest DWV RNA loads were recorded in the testes and the digestive tract, followed by mucous glands and seminal vesicles. Traces were also found in the head and sperm. The virus was detected in a majority of epithelial cells (a layer of cells that lines a cavity) located in the proventriculus, midgut and hindgut, suggesting that the digestive processes could be significantly impaired by the infection. Furthermore, intensive replication of DWV in the seminal vesicles could have a significant effect on drone fertility if the maturation of spermatozoa were inhibited. The presence of DWV in the mucus glands and testis epithelia explains the detection of virus in the sperm, which could act as a vehicle for virus transmission to queens and their progeny.

Chen et al. (2006) evaluated individual asymptomatic queens for virus in the queen's feces and tissues, including blood, gut, ovaries, spermatheca, head and eviscerated body Virus was found in all tissues except the head. The percent virus positive samples were: blood (100%), ovaries (100%), eviscerated body (100%), feces (90%), gut (80%) and spermatheca (80%). When queens in colonies were found to be positive for DWV, the virus was detected in their offspring as well, including eggs (100%), larvae (79%) and adult workers (25%). The presence of virus in the tissue of the queen's ovaries, eggs and in young larvae suggests vertical transmission of DWV from queens to their offspring. Virus found in the feces and gut of queens implies ingestion of the virus in contaminated food.

de Miranda and Fries (2008) verified the transmission of DWV to queens via infected drone semen by instrumentally inseminating DWV-free virgin queens. High levels of DWV could subsequently be detected not only in the spermatheca, but also in the ovaries. Subsequent vertical transmission of the virus to the progeny of infected queens was also demonstrated, though neither method of transmission was observed to be 100 percent effective. Whether venereal transmission of DWV occurs during natural mating remains to be determined. The concentration of virus in the reproductive tissues of both queens and drones suggests that DWV infection could have deleterious effects on their reproductive fitness, consequently affecting colony performance and productivity, swarming and queen supersedure. The possible transmission of DWV through sperm could have major implications for virus transmission between colonies and queen rearing operations, as drones may spread the disease to other colonies by drifting or mating with queens in the drone congregation areas (Fries and Camazine 2001).

The principal mode of pathogen transmission (horizontal vs. vertical) is important to consider when molding pathogen virulence both at the individual bee level and at the colony level (Fries and Camazine 2001). The potential for both horizontal (fecal-cannibal-oral) and vertical (parent-offspring) transmission among bees gives DWV a particularly dangerous advantage, especially when drone bees are the vector (Chen et al. 2005b, 2006; Yue and Genersch 2005; Yue et al. 2006; Fievet et al. 2006). Vertical transmission through drones can be achieved two different ways: 1) directly through fertilization of the egg with contaminated semen; 2) indirectly through venereal infection of the queen reproductive organs (a type of horizontal transmission from infected males to females), where a subsequent vertical transmission of the virus to the offspring from newly infected ovaries completes the act. In the first instance, only fertilized eggs (workers/queens) will be infected, but in the second scenario both worker/queen and drone progeny will be infected.

The current research has described three characteristics of deformed wing virus that can be used to estimate the activity of the virus in managed hives: 1) virus replication in mites correlates with virulence; 2) bees with deformed wings and healthy looking bees differ in the level of virus replication; 3) differences in the spatial distribution of DWV correlates with wing deformity (Yue and Genersch 2005). Furthermore, research suggests that a major factor influencing the outcome of *Varroa* infestation is the proportion of DWV-transmitting mites within a mite- infested hive. Since *Varroa* mites are highly associated with deformed wing virus, it is important for beekeepers to keep *Varroa* mite populations below economic thresholds. Colonies with individuals with deformed wings need to be replaced since they are likely serving as virus reservoirs and viral replication centers.

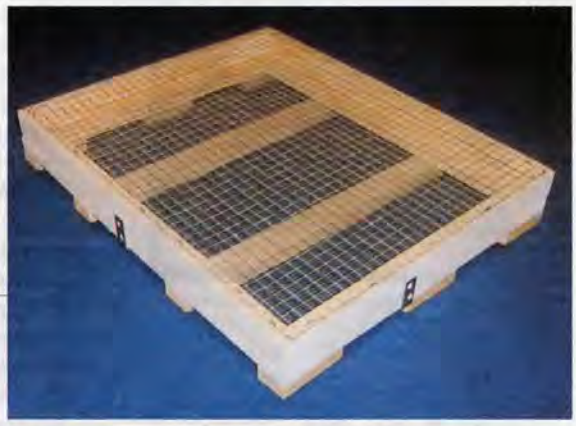
These studies have shown that deformed wing virus can be transmitted, horizontally, vertically, and through venereal transmission. Besides *Varroa* mites, it is clear that the reproductive castes are key players in virus transmission, as well. Ideally, it would be good to obtain queens that are certified virus-free. Unfortunately, it is difficult to identify the virus status of queens without killing them. Hopefully in the future, researchers will develop a technique to test queens for DWV without harming them. The epidemiological significance of venereal-vertical virus transmission through drones may also be considerable. Research has shown that drones and their semen are potentially efficient vectors of this virus, with the capacity to infect entire generations of progeny through a single insemination. In bee breeding programs, semen samples

Continued on Page 47

A COMMERCIAL GRADE OPEN BOTTOM BOARD

John Hoffman

Inexpensive and Easy To Build



The Commercial Open Bottom Board (OBB) is the second generation version of the original OBB described in *Bee Culture* (December 2006, page 49, March 2007, Page 52 and January 2008, page 37). It is a "poor man's" model; very inexpensive and easy to build. It lacks the Sticky Board and sticky board slot but, after installation, will still provide the same level of perpetual *Varroa* mite population reduction and control as the first generation OBB.

This system has two major components, the Screened Frame and the Shipping Cover Construction pictures with assembly and application notes are included for both items.

General Information

This modified OBB device was developed to answer the concerns of hobby beekeepers with more than a few colonies of bees and the commercial beekeeper with multitudes of colonies. Those individuals can ill afford the time or expense associated with periodic study of the debris and mite drop using the sticky board method. The good news is that excellent *Varroa* mite population reduction and control is possible without the sticky board equipment and mite count inspection routine. The elimination of "sticky board" equipment and related operating costs renders this option a viable alternative for the larger bee operations.

The labor expense savings, associated with the mite drop count test, can best be illustrated when calculating it with the arbitrary number of 300 colonies.

Example: It takes me an average of a half hour to coat a "sticky board" with petroleum jelly, place the board in the OBB slot, remove it, count and record the live mite count and then clean the board.

Processing 10 boards per day would require five man hours per day In 30 days I will have checked 300 colonies at a cost of 150 man hours; more than half of the available man hours (eight hours per day x 30 = 240). After 30 days all 300 colonies will have been checked and it is time to repeat the same scenario.

After the initial material, fabrication and installation costs the Commercial OBB device will operate *free* without any effort, operating time or maintenance required from either you or the bees. The system is like a perpetual motion machine. Without energy input or expenditure, it will run effectively and efficiently forever, 24 hours per day, 365 days per year, regardless of the weather

The Sticky Board method of live *Varroa* mite drop count is an indispensable tool for both researcher and the curious hobby beekeeper However, I predict that in the near future the sticky board will be more recognized and valued as a diagnostic tool. This will be possible only after the completion of intensive study and identification of brood chamber debris, to attain a better understanding of it's patterns and content.

Construction and Application

Screened Frame:

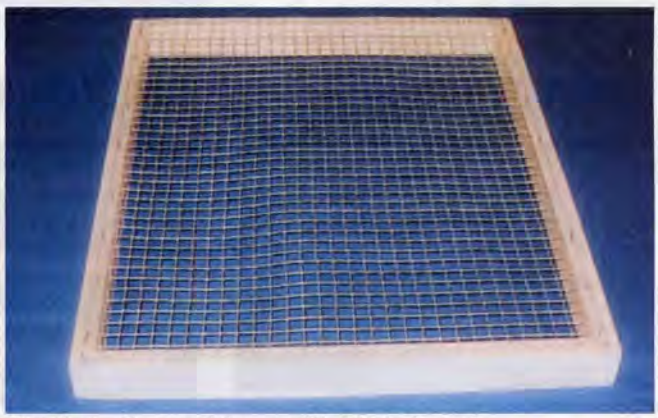
Parts List:

2 Pc. – Wood Frame ¾" x 1½" x 20"
2 Pc. – Wood Frame ¾" x 1½" x 15"
1 Pc. – Wire screen 15½" x 19½" (½" mesh, 19 gauge galvanized wire)

Wood Material: Pennsylvania Hemlock, Western Red Cedar, Pine, etc.

Purpose & Assembly: The Screened frame is a wooden rectangular frame. Outside dimensions are 16½" x 20" The frame wall is ¾" thick. The wall height is 1½" The purpose of the frame is to support the "Critter Guard Screen." The wire screen covers and is stapled to the top of the wooded frame.

Note: Since there is no slot to enclose the screen, the screened frame is placed on the hive stand (with the attached screen on top) directly beneath the open brood chamber Wood joints may be secured using screws, nails or construction staples. Regardless of your choice. It is important to also use a good **waterproof** wood glue. The type of joint is also your option; I use a plain butt joint using wood screws and waterproof glue.



Top view – Screened frame with 1/2 inch mesh.

Bottom view – Shipping frame with #7 mesh.

Application Notes:

When in use, this Commercial OBB device will require the following:

(a) Hive Stand: Some form of hive stand that will provide an open unrestricted airspace between the bottom of the open brood chamber and the ground or base plate.

(b) Wind Protection: The hive stand must also provide the OBB device with adequate protection from the East and West winds. (ref. *Bee Culture* January 2008, page 38 for complete information on the hive stand I use).

(c) Moisture Control: Applications in the colder northern climates may require the use of special Winter hive configuration methods which include moisture control with an operating dead air space in the brood chamber Although there was an insert board and slot available with the original OBB model to partially restrict the OBB opening during low temperature/windy conditions, neither the board nor the slot are included in the Commercial OBB unit design.

(d) Live Mite Drop Count: Despite not having the sticky board and slot provided with this system, it is still possible to obtain an approximate live mite drop count. The mite count will not be as accurate or consistent as when derived using the original system. However, it will be sufficient to satisfy the beekeeper that the system is still working.

(e) Mite Count Procedure: Apply a thin layer of petroleum jelly to one side of a white, or painted white, 14" minimum x 18" minimum flat panel. Place the panel, sticky side up, on the ground centered directly below the screened frame. After 24 hours, remove the panel and count only the live mites. (Ref. *Bee Culture* March 2007, (pages 50-52) "Open Bottom Board – Assembly & Applications Notes" for detailed information on using the sticky board and counting the live mite population).

Shipping Moving Cover:

Parts List:

2 Pc. – Wood frame ¾" x 1½" x 20"

2 Pc. – Wood frame ¾" x 1½" x 13½"

2 Pc. – Wood long foot Pad ¾" x 1½" x 16½"

6 Pc. – Wood short foot Pad ¾" x 1½" x 3"

1 Pc. – #7 mesh (seven holes per inch) wire screen 15" x 18½" (Note: #8 mesh may be used but more hive debris will accumulate on the screen while in transit.)

4 Pc. – Metal corner brace 1½" x 5/8"

Material:

Wood: Pennsylvania Hemlock, Western Red Cedar, pine, etc.

Purpose & Assembly: The Shipping Cover is a rectangular shaped frame. Outside dimensions are 16½" x 20" The frame wall is 1½" thick. The wall height is ¾" It has six ¾" thick x 1½" x 3" footpads attached to the bottom of the frame (three pads evenly spaced along each of the frame's short 16½" sides). There are two additional long footpads ¾ thick" x 1½" x 16½" that are evenly spaced along the 20" sides between and parallel to the two rows of small footpads and attached to the bottom of the frame. The purpose of the frame is to support the 15" x 18½" #7 mesh wire screen that is stapled to the bottom of the wood frame. The screen, which is sandwiched between the ¾" thick frame and the ¾" thick footpads, contains the bees in the hive during shipping or moving. The footpads strengthen the butt joints on the four corners of the frame. More importantly, they assure fresh air for the bees. The four metal corner braces secure the shipping cover to the screened frame and maintain alignment while in transit. Construct the 16½" x 20" frame. Wood joints may be secured using screws, nails or construction staples. Regardless of your choice, it is important to also use a good waterproof wood glue. The type of joint is your choice; I use a butt joint with screws and waterproof glue. Lay the frame, bottom side up, on *Die Schnitzel bank* a little PA Dutch there. Translation = "the workbench" or shaving bench when used to prepare shingles – "bank" is pronounced "bonk"). Center the 15" x 18½" #7 wire mesh screen on the frame. Stretch and staple the screen to the bottom of the frame. Use plenty of staples within ¼" of, and parallel to, the inside edge of the frame. Any space or excessive play in the screen will allow bees to force themselves between the screen and the wood where they will perish.

Attach the footpads over the screen to the frame. I prefer to attach the foot pads with flathead screws and a good waterproof wood glue.

Safety Hazard: The raw and fraying edges of the #7 wire mesh screen create a serious safety hazard when handling the shipping cover To eliminate this hazard, all exposed raw edges of the #7 wire mesh, in the open areas between the foot pads, must be coated and secured to the wood frame with a good long life exterior grade "Acrylic Latex Sealant Plus silicone" sealant.

Angle Braces: While still working on the bottom surface of the frame, attach one leg of each corner brace to that surface of the frame on the outside edges. The other leg of each

Bottom view – Shipping cover with foot pads and corner braces.

Top view – Assembled shipping cover.

brace will extend toward and go beyond the top surface of the frame. A brace will be placed at the center and on the outside edge of each long side of the frame. A brace will be placed on the outside edge of each short side of the frame. These two braces will not be centered on the short sides of the frame but can be placed on either side of the previously centered and attached short foot pad. I prefer to stagger these braces, placing one brace along side the pad on one end of the frame. Then, on the other end of the frame, place the other brace along side the opposite end of that short pad.

Turn the frame over with the foot pads down. Staple the wire mesh to the exposed top sides of the two long footpads, again being careful to thoroughly secure the screen so the bees cannot force their way under the screen.

Application:

When the ½" mesh screened frame and brood chamber assembly are placed on top of this cover frame for shipment, the four corner braces will keep the two frames aligned. Two pair of wood screws inserted into the ½" mesh screened frame through the top holes of any opposite pair of corner braces will secure both frames while in transit. BC

John Hoffman builds bottom board at his home in Mount Holly Springs, Pennsylvania.

Beekeeping with Twenty-five Hives

A newly published e-book for a prosperous income and a rewarding outcome.

Read sample chapters on-line
http://www.25hives.homestead.com
or write:
3721 North High Street
Jackson, MO 63755

THE BEE SPACE
www.TheBeeSpace.com
Rauchboy Smokers Stay Lit! They Just Won't Quit
U.S. Distributor of Rauchboy Smokers

Order today!
Ready-Made Patties
From
Global Patties
In North America Call Toll Free
1-866-948-6084

Elsewhere worldwide call 1-403-948-6084 or email *mike@globalpatties.com*

"We make Protein Patties for Honey Bees to your specifications"

Visit us at www.globalpatties.com for the latest news on pricing, quantities, discounts, shipping and distributors

Ask us for a quote on your requirements for the coming season. You'll find that **Global** is faster, better and cheaper than your other options.

A CLOSER LOOK ... Cont. From Pg. 44

should also be tested for virus prior to instrumental insemination. BC

References

Ball, B.V and L. Bailey 1997 *Viruses.* In Honey Bee Pests, Predators, & Diseases, 3rd Edition (Eds. R.A. Morse and K. Flottum), A.I. Root Co., Medina, OH, pp. 11-32.

Bowen-Walker, P.L., S.J. Martin and A. Gunn 1999. *The transmission of deformed wing virus between honeybees (*Apis mellifera *L.) by the ectoparasitic mite* Varroa jacobsoni *Oud.* J. Invertebr. Pathol. 73: 101-106.

Chen, Y.P., J.A. Higgins and M.F Feldlaufer 2005a. *Quantitative real-time reverse transcription-PCR analysis of deformed wing virus infection in the honeybee (*Apis mellifera *L.)* Appl. Environ. Microbiol. 71: 436-441.

Chen, Y.P., J.S. Pettis and M.F Feldlaufer 2005b. *Detection of multiple viruses in queens of the honey bee* Apis mellifera *L.* J. Invertebr Pathol. 90: 118-121.

Chen, Y.P., J.S. Pettis, A. Collins and M.F Feldlaufer 2006. *Prevalence and transmission of honeybee viruses.* Appl. Environ. Microbiol. 72: 606-611.

de Miranda, J.R. and I. Fries 2008. *Venereal and vertical transmission of deformed wing virus in honeybees (*Apis mellifera *L.).* J. Invertebr Pathol. doi:10.1016/j.jip.2008.02.004.

Fievet, J., D. Tentcheva, L. Gauthier, J. de Miranda, F Cousserans, M.E. Colin and M. Bergoin 2006. *Localization of deformed wing virus infection in queen and drone* Apis mellifera *L.* Virology J. 3: 16 doi:10.1186/1743-422X-3-16.

Fries, I., and S. Camazine 2001. *Implications of horizontal and vertical pathogen transmission for honey bee epidemiology.* Apidologie 32: 199-214.

Tentcheva, D., L. Gauthier S. Jouve, L. Canabady-Rochelle, B. Dainat, F Cousserans, M.E. Colin, B.V Ball and M. Bergoin 2004. *Polymerase chain reaction detection of deformed wing virus (DWV) in* Apis mellifera *and* Varroa destructor Apidologie 35: 431-439.

Yue, C. and E. Genersch 2005. *RT-PCR analysis of deformed wing virus (DWV) in honey bees (*Apis mellifera*) and mites (*Varroa destructor*).* J. Gen. Virol. 86: 3419-3425.

Yue, C., M. Schroder K. Bienefeld and E. Genersch 2006. *Detection of viral sequences in semen of honeybees (*Apis mellifera*): evidence for vertical transmission of viruses through drones.* J. Invertebr Pathol. 2: 105-108.

Clarence Collison is a Professor of Entomology and Head of the Department of Entomology and Plant Pathology at Mississippi State University, Mississippi State, MS.

INCREASING BEE PASTURE IN ISRAEL

Michael Brown

Eucalyptus erythrocorys, Ceratonia siliqua and Ziziphus spina-christi may not mean much to most American apiarists, but they are at the forefront of an ambitious project in Israel to vastly increase bee pasture and ramp up honey production.

Lin's bee farm is located in a quiet farming village on Israel's coastal plain. Though the village itself is an oasis of fruit trees and field crops, the surrounding area is becoming increasingly less "nectar-friendly" for local beekeepers. In previous years citrus groves covered large portions of this area and supplied apiarists with abundant sources of nectar Aharon Cohen, of Lin's, laments the loss of these groves. "Years ago our village was surrounded by citrus orchards. Today most of them have been uprooted or are not being worked."

Two main factors have contributed to this trend, which has been going on for several decades. First of all, the citrus branch in Israel has become much less profitable as competition from countries like Spain and Morocco and high water prices have significantly reduced profits. Secondly, this area has faced rapid development and many of these groves have been uprooted or neglected as land waits to be developed. In other parts of the country, development – both agricultural and residential has also cut down on the amount of wildflower pasture.

Yanay Sachs is another beekeeper in this region from the village of Tzofit. He earns his living through pollination services and honey sales from his close to 700 hives. During March and April he is still able to produce citrus honey from remaining local groves, but afterwards he characterizes his area as a "green desert." In years past he could leave some of his hives (about 250) near his village only during the time of the citrus flowering. Afterwards he was forced to move them in search of food for the bees. Now, his participation in the bee pasture project has helped him reverse this trend.

One of the main participants in this project is the Jewish National Fund (JNF). This organization is usually associated with reforestation and recreation-related development in Israel. Since it was organized in 1901, over 240 million trees have been planted in the country, covering once barren hills with vast forests. In fact, Israel has the distinction of being one of the few countries in the world that have more forested area now than 50 years ago.

The other organizational participant is the Israel Honey Board. This is the umbrella organization for all

matters dealing with beekeeping and honey in the country They deal with honey standards and marketing, help with continuing education of beekeepers, and act as a liaison with the government, among many other things.

The third pillar of the project is the country's 450 beekeepers, who, with their 90,000 hives are on the front lines of pollination and honey production in the country

The JNF bee pasture project aims to add new sources of nectar and just as importantly, make available sources of nectar during the hot dry Summer months when the country's wild flowers are no longer in bloom and other sources of nectar have dried up as well. Simply put, the JNF/Honey Board grows and distributes the trees to the beekeepers, who plant them.

David Brand, head of the Forestry and Development Department of the JNF, has been researching the topic of nectar producing trees for the last 10 years. He has led the search for the "mega-producers" – those varieties of trees that seem like they were created especially to produce nectar Once these trees have been identified, research is conducted in an effort toward finding those varieties most suited to Israeli conditions and make them available to apiarists throughout the country. The saplings are grown in several regional nurseries.

The JNF grows a number of trees for nectar production. The most popular among beekeepers are several varieties of eucalyptus, particularly woodwardii, torquata, torwood and erythrocorys. These four varieties produce almost a continuous supply of nectar throughout the year This is especially important because the Autumn and Summer months are considered to be a time of low nectar availability and during this period many beekeepers need to resort to artificial feeding of their bees.

An advantage of using trees as a nectar supply is that trees are less dependent on rainfall for nectar production. The amount of honey produced in Israel can vary significantly from year to year dependant on the year's rainfall – primarily because of the availability of wild flowers. According to David Brand, head of the forestry & development department of the JNF, "in general, trees will produce the same amount of nectar from year to year and there is therefore less fluctuation compared to wildflowers. Extreme weather conditions before or during the flowering season will influence the amount of flowers and nectar "

How hve Israeli beekeepers benefited from this program? Yanay, from Tzofit is a good example. He explains that I "noticed a significant change in the condition of my hives after I planted the trees, and although some of the trees are still young, in some groves I can now leave my hives by the groves most of the year "

Because Yanay only owns about eight acres, he has had to be creative in finding places to plant all the trees that he receives as part of the bee pasture project. "In order to utilize more land and plant more trees, I obtained an agreement with my neighbors to use some of their land that was not in production. When I chose trees to plant, one of my considerations was to choose trees that grew straight and fast for wood production. My agreement with my neighbors was that in exchange for using their land and planting and maintaining the trees, they would have the right to cut the trees every 15 years and sell the wood, which is of a very good quality and fetches a good price." Some of the trees he has planted are *Eucalyptus camaldulensis, Eucalyptus leucoxylon, Eucalyptus erythrocorys, and Eucalyptus torquata.*

Ein Harod apiary in Israel's Jezreel Valley, produces a number of interesting honey varieties based on plants in locations throughout the country They have been receiving up to 800 plants a year which they plant in the vicinity of their hives primarily eucalyptus and ziziphus saplings. The ziziphus augments their already established line of ziziphus honey and the eucalyptus will form the basis for a product of this honey variety that they hope to produce in the near future. Because many of the trees have yet to mature, it is still early to quantify an increase in supply

As the project continues, David Brand states that "researchers continue to investigate new varieties and test their adaptability to conditions in Israel." In the near future we anticipate keeping the supply at around 100,000 saplings a year "

As these hundreds of thousands of trees continue to mature in the coming years, Israel's beekeepers are poised to reap the benefits of a far-sighted program that is a win-win situation for the country, the bees and the beekeepers. BC

Yanay Sachs, beekeeper, yanaysachs@walla.com; Israel Honey Board, www.honey.org.il (Hebrew only), honey@honey.org.il; Lin's Bee Farm, www.linfarm.co.il/english/hp.aspx.

Michael Brown is a free lance journalist living in Kendall Park, New Jersey.

Oxalic Acid Vaporizer

The fastest Vaporizer available powered by a 12 Volt car battery. Contrary to liquid oxalic acid there is no harm to colonies.

For more info please call or visit our website

Heilyser Technology Ltd.

685 Dalkeith Ave., Sidney, BC, V8L 5G7 Canada
Phone/Fax: 1 250 656-8727 • Email: orioleln@shaw.ca
http://www.members.shaw.ca/orioleln

Hawaiian Queen

QUEENS

Ph. 808-328-2656

Toll free: 888-485-2244

FAX 808-328-7433

email: HIQUEEN@HIALOHA.NET

www.hawaiianqueen.com

SUBSCRIBERS OUTSIDE THE U.S.

Renew your subscription today and avoid missing any issues (Expiration date is located on the right hand side above your name on your mailing label.)

See example below

23456 (acct.#) 03/02 (exp. date)
John Brown
123 Water St.
Toronto Ontario X1X 2Y2
Canada

Please pay in U.S. Funds. Call 1.330.725.6677, Ext. 3255

Use Temperature To Monitor Hive Health

Frank Linton

You will be amazed at what you will learn!

Figure 4. Temperature sensor embedded in frame.

How many times have you discovered – to your surprise – that one of your colonies, healthy at the last inspection, is dead or dying? Would you like to get an early warning that the colony was in trouble? One way it might be possible to get an early warning of colony problems is by instrumenting the colony with temperature sensors. For example, we know that bees maintain the temperature in the brood area at 95°F, thus if we could measure the temperature throughout the hive, we could tell how much brood there was. If there were less brood than expected, it might be an indication that the queen wasn't laying, or that there were too few bees to care for the brood, or some other problem that affects brood production.

The size of sensors is shrinking rapidly and their price is falling. In the near future it should be possible to embed temperature sensors throughout a hive. Such a sensor network would enable us to determine the location and amount of brood, the location and size of the Winter cluster, and to observe and track other temperature-related phenomena of the colony.

A complete temperature sensing system would include the temperature sensors, a means of transmitting the data to a collection point and storing it there, a means of forwarding the data to your computer and interpreting it, a way to send warning messages to your cell phone, etc. Today, such a system would cost thousands of dollars, but there is a much cheaper alternative, available to you now, that will tell you something about the state of your colony without opening the hive.

You may recall that bees do not control the temperature of the whole hive, but of certain areas of it, so you need to embed temperature sensors in the comb, as in Figure 1 and Figure 2.

To embed a temperature sensor in the comb I purchased a wireless indoor/outdoor thermometer, Figure 3. I carefully disassembled the remote outdoor unit, discarded all unnecessary components and packed the remainder in a project enclosure, leaving the temperature sensor exposed. I fastened the project enclosure to the inside of a deep frame, trimming away the foundation around it. The wire on the sensor was just long enough to reach the center of the frame, see Figure 4. Initially, I fastened the sensor in place near the embedded wire with a bit of thread. The bees accepted the frame with the black enclosure, drew out the comb, and began raising brood in the frame. With this setup you can obtain temperature readings from the center of a frame.

The wireless indoor/outdoor thermometer that I purchased was a single-channel unit, meaning that there was only one remote "outdoor" unit. However, three-channel units are available from Radio Shack and from other companies, so you can have up to three separate temperature sensors in one hive. You might put them in the third, fifth, and seventh frames of a hive body to get an indication of the activity in the center of the hive.

Seeley, in *Honeybee Ecology* (1985, p. 107), citing several other authors, mentions that the temperature in the nursery region of the hive averages 34.5°C (94°F), and varies by less than less than 1°C (2°F) per day Winston in *The Hive and the Honey Bee* (1992, p 88) makes the same claim. I found, in contrast, that the temperature could vary by quite a bit. For example, I installed the temperature sensor in my observation hive in late September The bees had drawn out the comb and were

Left Figure 1. Temperature sensor embedded in comb.

Right Figure 2. Reading the comb temperature with a wireless thermometer.

Figure 3. Wireless Thermometer.

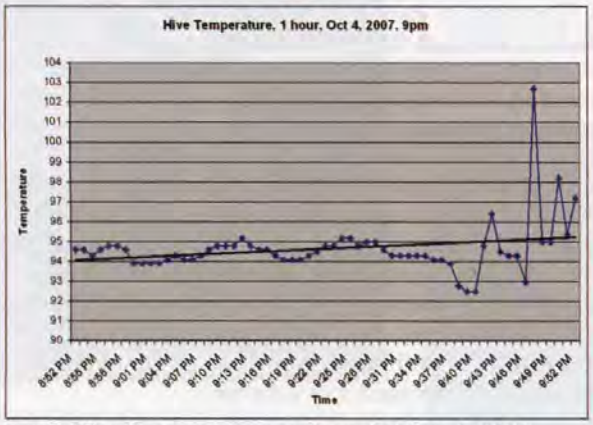


Figure 5. Hive Temperature; one hour, October 4, 2007

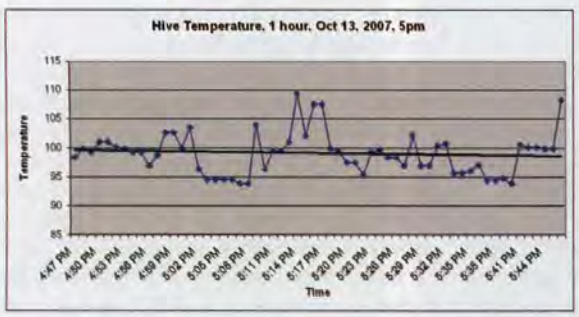


Figure 6. Hive Temperature; one hour, October 13, 2007

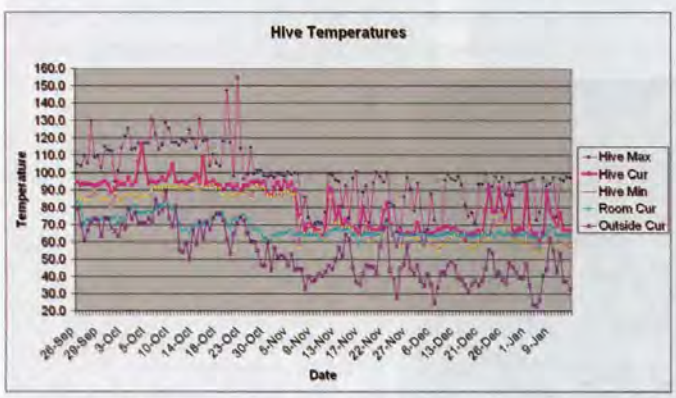


Figure 7 Hive temperatures, Fall 2007

raising brood around the sensor in early October On October 4th and October 13th I recorded the temperature in the brood area at one-minute intervals. In the first case, Figure 5, the temperature stayed between 94°F and 95°F for 45 minutes, and then seesawed up and down for the last 15 minutes from a minimum of 92.5°F to a maximum of 102.7°F

In the second case, Figure 6, the temperature stayed between 94°F and 95°F for only 6 minutes, it seesawed the whole hour, from a minimum of 93.9 to a maximum of 109.4. Most of the time the temperature was above 95°F, averaging around 99°F for the hour

What is happening to create these varied temperatures? Honey bees generate heat by flexing the flight muscles in their thoraxes. Apparently the thorax of the honeybee must be capable of generating much higher temperatures than 95°F if bees are to keep the brood area warm at that temperature. By way of analogy, the furnace burner that keeps my house warm in Winter has a much higher temperature than the house itself. In the hive, the high temperatures are caused by bees generating heat very close to the sensor

The next figure, Figure 7, shows the temperatures I measured approximately daily in the Fall of 2007, from late September through early January The heavy violet line marks the temperature at the sensor at the time the measurement was taken. The thinner violet lines above and below this line mark the highest and lowest temperatures recorded since the previous reading. The blue line is the temperature of the room where the observation hive is located, and the purple line is the temperature outdoors.

A number of features can be discerned in Figure 7 First, at the sensor, the temperature hovers around 95°F until November 6, when it drops to the high 60s, clearly indicating the date that brood rearing ceased near the sensor (and on the frame). Also, as noted earlier, at any given moment the temperature at the sensor can vary widely from a high of 117°F on October 5, to a low of 61°F on January 5.

Second, as mentioned, the thermometer unit records the highest and lowest temperatures since the last reading. The sensor lows are generally between the current sensor reading and room temperature (set at 65°F daytime in the Winter), but sometimes they are below room temperature because it records the overnight low in the hive which tracks the overnight low in the room (as low as 55°F in the Winter). It seems reasonable that the low temperature in the hive is usually about room temperature.

The high temperatures are more interesting. They are far higher than anything I had expected. Six times the thermometer recorded peaks of 130°F or greater, including one peak at 148°F, and one at 155°F If you saw one of these readings you might think the hive was on fire! Or that the sun was overheating it. But it was neither The high heat came from the bees themselves. Clearly you need to take the average of several readings to obtain a reliable indication of the temperature in the hive.

A final observation of the maximum high temperature line pertains to the period of October 27 to November 7, when the high temperatures range only from 98°F to 102°F This sudden limitation of the maximum high temperature may predict the cutoff of brood raising. Cer-

tainly, many more observations will be needed before a conclusion may be drawn on this point.

I believe that if temperature sensors were embedded in the honey super given to bees for Winter feed, the state of the Winter cluster could also be monitored. I have not tested this hypothesis as my observation hive is inside my house where it is unnecessary for the bees to form a cluster

To sum up, by monitoring the temperatures inside a hive, you can determine whether brood is being reared in the vicinity of the sensors. While a single sensor measures temperature at only one location; and a complete understanding of the amount and location of brood would require sensors at multiple locations, you can learn quite a bit about the state of your hive, including the amount of brood and the health of the queen, with an economical three-channel wireless thermometer available today. BC

Vented Bee Hive Cover
Inventor: Norman R. DeYoung
Patent 6579147

Features & benefits:
- Uses all-natural ventilation
- Wooden frame fits around hive
- Screening promotes natural air flow
- Increases production of honey
- Virtually maintenance-free

608-794-2497
Fax 608-794-2704
(Prices subject to change)
PO Box 7
9392 Old Beetown Road
Beetown, WI 53802

Cover with shipping & handling $43.00 (in the 48 states)

The patented **Vented Bee Hive Cover** uses natural ventilation to keep bees cool during hot periods, encouraging the bees to continue working hard to produce honey. The innovative passive device with absolutely no moving parts takes the shape of a box frame made from wood and covered with stainless steel screening. Once in place over the hive, the all-natural ventilation is produced by the movement of the bees' wings. Thus, a cooler hive increases production of honey in the summer.

MDA SPLITTER NUC BOXES
OUTBREEDING MITES AND
OVERWINTERING HONEY BEE NUCS
www.mdasplitter.com
616.241.3235

TABER'S on the web

honeybeegenetics.com
disease resistant

RUSSIAN QUEENS & PACKAGES

Phone 707.449.0440
P.O. Box 1672
Vacaville, CA 95696
www.honeybeegenetics.com

PACIFIC NW BRED QUEENS
VSH/ RUSSIAN/ WILD SURVIVOR STOCK
OLYMPIC WILDERNESS APIARY

HYGIENIC • MITE RESISTANT
Abundant Drones
Isolated Mating Yards
Hardy. Work @ Cooler Temperatures
— No pkg bees —
Queens Available Summer & Fall ONLY
(866) 204-3426 (toll free)
www.wildernessbees.com

Stay Better Informed

With a subscription to

THE SPEEDY BEE
The Beekeeper's Newspaper

Published monthly. Reporting the latest news affecting the beekeeping and honey industry

CALL OR WRITE FOR A *FREE* SAMPLE COPY

THE SPEEDY BEE
P.O. Box 1317 • Jesup, GA 31598
Ph. 912.427.4018

QRC Queens & Colonies

Queen Right Colonies
The Beekeepers Shop

Mon-Sat 10 -6 (March Oct) • Mon-Sat 10-2 (Nov - Feb)
A full line of beekeeping supplies in stock year round

"Come as a stranger, leave as a friend."

Don't Forget Gift Certificates are Available

Rear Your Own Queens This Summer For Fall Requeening With Our Complete Queen Rearing Kit for **$69**
Make Extracting Honey A BUZZZZ This Summer With Our New 9-Frame Radial Hand Crank For **$425** or Electric **$785**
Make Supering A Breeze By Using Our Hot Dip, Complete And Ready To Use 6-5/8 Honey Supers For **$33**

Now Taking Orders Queens* – Gentle Italians – *that produce honey.
We will have five-frame nucs in new equipment available for pick up – only $85.

We ship UPS
All major credit cards accepted.

Never paint wooden ware equipment again!
All wooden ware equipment is available hot dipped with paraffin.

Denzil & Sheila St. Clair
43655 S.R. 162 • Spencer, OH 44275
440.647.2602
QRCstclair@midviewinternet.com
www.queenrightcolonies.com
www.LORAINCOUNTYBEEKEEPERS.ORG

Kids Can Make A Difference

Meet Some Incredibly Dynamic 5th Graders

K m Lehman

It all started with an environmental challenge, a wild swarm of bees and an inquisitive fifth grade class. In Sacramento there is a school called Sutterville Elementary In the school there is a special fifth grade class. In the class is a dedicated and dynamic teacher named Mitch Carnie and a group of 33 highly motivated 11-year-old learners. What they have done this school year will boggle your mind.

While in Sacramento at the National Beekeeping Convention I presented a number of bee programs in their school. After meeting this class I discovered more about their year long mission.

Every year Mitch Carnie invites his class to take on the Disney Environmentality Challenge. The purpose of the program is to encourage students to think and act environmentally at school, at home, and in their communities. Last year's class did a project on the burrowing owls and raptors and found themselves heading to Disneyland, landing themselves the top prize for this environmental contest. Can this year's students in Room 22 do it again? I would say so.

"My idea was to have a solar-energy project for this year, but the students wanted to do the bee project," Carnie said.

A wild swarm of bees landed in the yard of Conner Daniels, age 11, sparking an interest and excitement about bees that spread throughout the classroom. This year's environmental topic was chosen – to learn more about CCD and help save the honey bees.

Sing Out

If you attended the National Beekeeping Convention in Sacramento last January you may have witnessed the sprawl of fifth graders sitting on the floor for the CCD presentations. The morning started off with a bang as these students performed a song they wrote, with the help of Ken Cooper, about CCD. The audience expressed their support and encouragement with a standing ovation! "That was one of my favorite parts of the project," said Chloe Del Duca, age10. After all the excitement the kids settled down to business, quietly jotting down notes about the most recent research on CCD and listening to beekeepers share about their losses and its effect on their profession.

The song has found its way onto the big screen. Two documentaries will be using the song, including "The Vanishing of the Bees," that will be released this fall. To take a sneak peek go the end of the video clip on You Tube at http://www.youtube.com/watch?v=PqotV9pOyBQ.

The class hopes to put the song on iTunes or Yahoo music for people to download and then give the money to CCD research.

Educational Events

The class organized a number of educational programs for the school and community At the school they presented an evening Bee Festival for families, offered a full day of hands-on activities to all the students, volunteered at the Kids and Bees program sponsored by the Foundation for the Preservation of Honey Bees, and will offer bee programs at Stone Lakes Wildlife Refuge and another in celebration of Pollination Week at their school in June.

Bee Adoption Program

The students compiled a list of beekeepers in the Sacramento area that would be willing to "adopt" bees that would otherwise be exterminated. That list was sent to exterminators urging them to refer people in need of bee removal to the beekeepers. An "honor roll" will be posted on the web site as a reward for those exterminators who saved bees through beekeeper referrals.

Other Pollinators

Through research and interviews with Dr Thorpe at UC Davis the class learned about mason bees. Being inspired to help the honey bees and increase pollination in local almond fields, the class made and installed 33 mason bee homes created out of recycled wood and milk cartons.

Continued on Page 57

VIRGIL – BOYS WILL BE BOYS

THE POLITICS OF ROME AND EGYPT HAD MORE INFLUENCE ON HONEY BEE BIOLOGY THAN YOU MIGHT SUPPOSE. AND NOW YOU KNOW THE REST OF THE STORY.

John Koster

Honey bees live in a matriarchy older than mankind – yet in the most famous classical account of the lives of the bees, the hives are ruled by kings rather than queens, and the bees themselves are chaste and reproduce without any sex at all. Publius Virgilius Maro – Virgil to modern students of Latin literature – produced a bit of a literary monster when he wrote Book Four of *The Georgics*, the one about beekeeping. This may not have been an accident, and it's no coincidence that Virgil's poetic manual on apiculture is an odd mixture of useful practical bee-keeping lore and entomological nonsense.

The diction of the Old Testament clearly indicates that the Hebrews of King Solomon's time understood that bees were primarily female, but when Virgil wrote the Georgics – a thousand years later – the bees are depicted as living in a male monarchy subject to tumult and rebellion.

But, if intestine broils alarm
the hive
(For two pretenders oft for empire strive),
The vulgar in divided factions
jar
And murmuring sounds proclaim the civil war...
With gorgeous wings, the marks
of sovereign sway,
The two contending princes
make their way
Intrepid through the midst of danger go.
Their friends encourage and amaze the foe...
That long the doubtful combat they maintain,
Till one prevails – for only one can reign!"

Virgil's advice to the farmers he attempts to educate is to favor the legitimate monarch, easily recognized by his noble demeanor, restore him – not her – to control of the hive, and punish the usurper by extirpation.

"When both the chiefs are sundered from the fight
Then to the lawful king restore his right;
That he, who best deserves, alone may reign.
With ease distinguished is the regal race:
One monarch wears an honest open face:
Shaped to his size, and godlike to behold,
His royal body shines with specks of gold,
And ruddy scales; for empire he designed,
Is better born and of a nobler kind
The other looks like nature in disgrace:
Gaunt are his sides, and sullen is his face."

What Virgil is describing here appears to be the swarming from overcrowded hives, and the lawful execution he recommends would appear to be a form of man-made selection – killing whichever of the "princes" – read here queens – had the least robust appearance could be taken as a method of improving the breed. But that's not exactly what he had in mind. A little further, he offers some better advice about routine swarming as opposed to the civil broil variety: protective custody and the hostage system rather than regicide.

"But, when the swarms are
eager of their play,
And loath their empty hives,
and idly stray.
Restrain the wanton fugitives, and take
A timely care to bring the truants back.
The task is easy – but to clip
the wings
Of their high-flying arbitrary kings.
At their command, the people swarm away:
Confine the tyrant, and the slaves will stay."

Some of Virgil's other advice is quite sensible. He advocates sheltering hives, locating them near water, and even building "floats" or "bridges" so the bees can drink without risk of drowning.

"The banks of brooks may make a cool retreat
For the raw soldiers from the scalding heat,
And neighboring trees with friendly shade invite
The troops unused to long laborious flight.
Then o'er the running stream, or standing lake,
A passage for thy weary people make;
With osier floats the stranding waters strew;
Of massy stones make bridges, if it flow;
That basking in the sun thy bees may lie,
And resting there, their flaggy pinions dry."

Making floats out of osier – the woven branches of green willow, sometimes used for shields, often for baskets – is good practical advice to help the bees collect water without being collected by it, and in fact tupelo honey beekeepers in the past floated their beehives on rafts. Virgil also understood the relationship between the flowers bees gathered from and the type of honey they

produced. He advocated:

"Wild thyme and savory set around that cell,
Sweet to the taste, and fragrant to the smell;
Set rows of rosemary with flowering stem,
And let the purple violets drink the stream....

And also...

"Sweet gardens, full of saffron flowers, invite
The wandering gluttons, and retard their flight...
And with wild thyme and savory plant the plain...
And deck with fruitful trees the fields around,
And with refreshing waters drench the ground."

Virgil tells us that he got most of his learning about bees from "an old Corycian swain" who turned some otherwise hardscrabble farmland into a garden spot through bee culture and the cultivation of other crops adapted to poor, rocky soil and steep slopes. Subsequent scholarship suggests that the old farmer may have been one of the Cilician pirates domiciled in Calabria, in southern Italy, by Pompey during the earlier years of the century The Cilician pirates had been the terror of the Mediterranean 50 years before and their suppression marked the last important stage in Roman control of the sea. Cilicia, in present-day Turkey in Asia Minor, was famous for its agriculture and located near Greece, where treatises on beekeeping had long been available.

The mystery, of course, is how Virgil, who offers so much useful advice about practical beekeeping, the shading of hives, just which flowers to plant, and the necessity for clean water, could fail to notice the central fact of bee culture: bees live in a female-dominated society where the male drones are useful for just one thing – and are often driven out of the hives to die in Autumn because they become wasters of food once their sexual role is no longer needed. The all-important queen bee, sheltered and protected, nurtured on royal jelly, her whole female body emblematic of her status and power, is vital to the survival of the hive and the survival of the race. No queen, no bees – and no honey or wax, both vital in classical culture for food and for art works. Virgil avoids two subjects: how bees are ruled, and how they procreate and proliferate. He alludes to bees gathering children from the leaves, and flowers, or, as an alternative, that the bees are generated from the decaying carcasses of animals, especially cattle. In Virgil – as opposed to the natural world – bees are ruled by males, and don't have sex lives. Why and why not?

Virgil was the esteemed protégée of Augustus Caesar, the first actual Roman emperor, and unlike some other authors – notable Ovid – Virgil enjoyed Augustus's protection and the financial support of Maecenas, Augustus' moneyman, for his entire career. To do this, he had to be very careful. Ovid was ultimately sent into exile for writing works that were a virtual manual for adultery and promiscuity at a time when Augustus was trying to restore Republican virtue – but not the Republic. Ovid wrote that the "games" – gladiator combats to the death – were a great place to pick up girls because the girls were already aroused and excited, as it were, by the bloodshed in the arena. He was also seen as a bad influence on Julia, Augustus's daughter – the all-powerful emperor never produced a male heir Julia was famous and eventually infamous for taking lovers behind her husband's back only after she was already pregnant, so the kids would look like the husband. "I never taken on the passengers until the cargo is safe in the hold," she once told a friend. Ovid would have seen this as clever rather than treasonous. Stuff like that got both of them kicked out of Rome. The signs of Augustus' distaste for dalliance were all there even when he was still called Octavian. His former ally and later mortal foe, Marc Anthony, cornered the market on wretched excess and dumped Octavian's sister, Octavia – both men actually admired her noble character, but Marc Antony wasn't a one-woman guy. Virgil was taking no chances. In Virgil's works, the women are either virtuous or suicidal. There are no excuses for misbehavior And Virgil's bees have a lot of babies and no sex at all – avoiding such topics as why mighty Augustus never had a male heir and why his female heir turned out to be such a disappointment.

"But (what's more strange) their modest appetites,
Averse from Venus, fly the nuptial rites.
No lust enervates their heroic mind,
Nor wastes their strength in wanton womankind;
But in their mouths reside their genial powers:
They gather children from the leaves and flowers.
Thus make they kings to fill the regal seat,
And thus their little citizens create."

History strongly suggests that *The Georgics* were published in 29 B.C., three years after the battle of Actium, which sealed the doom of Augustus' last rivals for power· Antony and Cleopatra. Marcus Antonius, once known as the strongest man in Rome, had been the loyal friend and deadly avenger of Julius Caesar, Augustus's uncle and benefactor. Cleopatra, queen of Egypt, had born Caesar a son she named Caesarion (son of Caesar) before Caesar was assassinated – while Cleopatra was living in his house in Rome – after Caesar's Roman wives had failed to produce a male heir Antony, Julius Caesar's right-hand man, had jilted Octavia, Augustus Caesar's sister to take up with the wanton queen of Egypt – as the Romans saw it. (Cleopatra herself, forced into ritual marriages with two of her younger brothers that were also incestuous – assuming that they were ever consummated – may never have had sex outside of wedlock, since she saw both Julius Caesar and Antony as lawful husbands. Antony and Cleopatra saw themselves as involved in a polygamous marriage – unknown in Rome, well-known in Egypt where the Pharaohs had many wives. Antony and Cleopatra adopted Antyllus, Antony's teenaged son by another wife, and Cleopatra presented Antony with twins, Alexander Helius and Cleopatra Selene, and another boy, Ptolemy Philadelphus. Augustus fell on this happy family like a ton of marble. Within a year after the defeat of Antony and Cleopatra at Antium, Caesarion, probably Julius Caesar's real heir, and Antyllus, teenaged son of his best friend, had both been beheaded by Romans "while trying to escape" and Antony and Cleopatra – despondent over the loss of the youngsters as well as the loss of power – both committed suicide to avoid further humiliation. To his credit, Augustus let the three children of Antony and Cleopatra live, and after a triumphal parade through the streets of Rome, Cleopatra Selene was married off to a client prince and given custody, with her husband, of both boys. August felt he couldn't afford to show the

same such mercy to the son of Julius Caesar, a rival for the role of heir as the boy's tutor later wryly wrote, "*It is bad to have too many Caesars.*"

Cleopatra, through Roman times and into the Renaissance, became the most vilified woman in history. Propertius, who liked to described his own emotional bondage to women, describes Cleopatra as:

"...that woman, she whose charms
Brought scandal on the Roman arms.
And strumpet to her very thralls,
Aspired to pass the Roman walls
And rule our Senate as the fee
Due from her lover's lechery

Virgil himself wouldn't even mention her name, and simply referred to her as *"– shame – his Egyptian spouse"* in *The Aeneid.* (Actually she was Greek on both sides, but since the both sides were sometimes brother and sister it wasn't hard to evoke a little shame – the Romans didn't like incest.) Horace, another poet close to Augustus, describes:

"She and her loathsome herd,
Of creatures vile with disease
So ungoverned,
So drunk with success,
That they could hope for anything!"

Horace also, however, described her suicide as an act of noble courage. This may have caused some trouble with Augustus, who always preferred Virgil, a more consistent sycophant. Virgil took no chances. Cleopatra's name couldn't even be mentioned in *The Aeneid*, and the bees were not allowed to be ruled by an all-powerful and pampered queen who dismissed her drones as they became useless to her, just as Cleopatra dismissed her first two teenaged brother-husbands. He even mentions one ritual in which Egyptians supposedly breed bees by smothering a bull and festering bees out of the carcass. Is the bull a metaphor for Roman males who wanted into Egypt only to meet their humiliating doom? History records Virgil died rich and honored and of natural causes. That's how bees got to be boys in *The Georgics.* BC

John Koster is a historian who touches on bees on occasion.

KIDS ... Cont. From Page 54

Research

The students conducted experiments, talked to experts, went to the entomology museum at UC Davis, tapped into books, magazines and the Internet to learn more about bees. Connor said, "I wasn't knowledgeable about CCD but as we progressed with the project I found out so much about bees and CCD."

Letter Writing Campaign

They wrote letters to lawmakers in California and Washington D.C. telling them about CCD and the implications of decreased honey bee populations. Connor would like to start a chain mail letter telling everyone about CCD.

In the News

The local paper, the Sacramento Bee – yes, that is the name of the paper – was so impressed by the work these students were doing they published a story about them.

Fund Raising

Fifth graders take a fitness test that includes push-ups, sit-ups, and a one-mile run. The class organized a fundraising triathlon to measure student's fitness and to raise funds for CCD research and education. Using pledge sheets students gathered sponsors for the race.

These kids have called and written to companies that use bee products in hopes of raising more funds. They were very excited to hear that Häagen-Dazs® had donated $250,000 to U.C. Davis for CCD research. When the company got wind of the effort these students were putting into CCD education, the company treated the entire class to an ice cream party. Sweet treats for work well done.

Other fundraisers included a school-wide penny drive plus making and selling bee products.

Conclusion

We often underestimate what kids are capable of. So often, students are bored with the memorization that occurs when educators are pushed to "teach to the test." Carnie looks at this project as an opportunity, "This is a great way to teach. I feel like kids this age should be doing environmental projects like this." Through this project these 10 and 11 year olds acquired skills and knowledge they can use throughout their lives. Things like grant writing, web design, publicity, project management and design, song writing, research, communication, processing and disseminating information, networking, self motivation, environmental awareness and, of course, the value of our tiny friends – the honey bee. Thank you Mr Carnie for going the extra mile and thank you students in Room 22 for your efforts and inspiration. These young people can indeed change the world.

Donations

Donations may be mailed to Room 22, Sutterville Elementary School, 4967 Monterey Way, Sacramento, CA 95822. Checks should be made out to Sutterville PTA, Room 22. Donations will be used for further public education about honey bees and CCD research.

The World Wide Web

Visit their website at www.beesavers.org.

With the help of a parent and Mr Carnie, the students created a web site to educate the public about CCD and honey bees. The site has an animated version of their CCD song, a blog, letters written to lawmakers, experiments, and other information.

CCD Song

Chorus
Honey bees please come home.
We need you here at the honeycomb.
That colony collapse disorder
Is crossing every border.
So honey bees please come home.
Why are the adult bees disappearing?
Is it from climate change or pesticides?
Are you feeling stress from malnutrition?
We need you and our crops to stay alive.
We want you to continue pollinating
And we'll do our best to solve this mystery.
Until then we'll eat organic honey
And build a hive where you'll be safe and free. BC

Kim Lehman is an environmental educator and producer of Bee Culture's *Kid's Page. You can reach her at www.beeladyprograms.com.*

Do You Hear What I Hear?

The Sounds Of Beekeeping

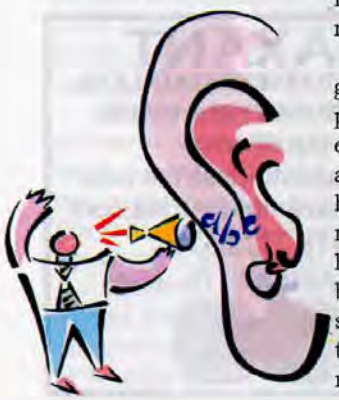
Ann Harman

It is a warm sunny Spring day and you see a fruit tree in full bloom. The tree hums with a very pleasant low note. Well, the tree itself is not really humming. Stand and listen to the bees working in the tree. Somehow this sounds conveys the vision of "busy as a bee." It is a peaceful sound even if it reflects hard work on the part of all those bees. To some, who are not beekeepers, it may seem an ominous sound. But to a beekeeper it signals all is well and the fruit harvest will be a good one.

Now let us walk over to the hives. The hum is there, perhaps a bit diminished as the bees are scattering to their respective hives. Here again all is well. The activity at the entrance signals that the colonies are in good condition.

As we stand there by a hive we can hear the occasional deeper buzz signifying that a drone has just returned from an unsuccessful flight in search of a queen. His humming sound certainly reflects his macho character

Shall we open a hive and see what the colony is doing? Light up the smoker Depending on the type of smoker fuel you may hear straw or pine needles crunching as it is being stuffed in. Here's a familiar sound – the whoosh of air made by pumping the bellows of the smoker Loud vigorous whooshes as it is being started followed by softer, quieter sounds as the smoke cools. You can always tell when a beekeeper's smoker is starting to go out. The sound becomes rather fast and frantic. The whooshes seem almost crisp and high pitched. Help! Don't go out now!



As we give a few puffs at the entrance a sound is heard. It is not an unhappy hum but it does suggest that the bees are not really pleased. A bit surprised, perhaps. A few puffs under the inner cover cause the hum to rise a few notes, then gently subside. You will hear that sound many times while you are inspecting your colony and giving a puff or two of smoke.

Listen to your hive, one with a healthy large colony, the next time you open one and attend to your particular project. So often we are too busy pulling out frames and generally poking around to listen to the sounds coming from the colony Learn what a healthy populous colony sounds like throughout the year Learn what a healthy colony sounds like as you manipulate the frames and give an additional puff of smoke. You can then differentiate between a strong colony and one that has a problem.

For example, a queenless colony just sounds unhappy No, that is not anthropomorphic. The sound is sort of hard to describe. A bit higher pitched perhaps but quite different from the sound heard at those first few puffs of smoke on a queenright colony. If you are a beginning beekeeper perhaps an experienced beekeeper will let you listen to a colony that is queenless. Keep that sound in mind. It is a good diagnostic tool. It will lead you to investigate further, to look for eggs, young larvae. No, it is not a nice sound but it is an important one in beekeeping.

Have you ever had that one annoyed bee flying in front of your veil? The one that buzzes insistently as it hovers in front of your face? The sound of that bee really makes its annoyance heard. All the other bees seem to be happy enough. That little pesky bee will follow you for a short distance just to make certain that you are paying attention to her request to you to leave. Her sound is very hard to ignore.

You can also hear the sound of a highly annoyed bee when it gets caught in your hair Perhaps it snuck in under your veil or accidentally flew in when you removed your veil. It's a determined sound, one that says she has discovered a furry wild animal and needs to sting it. As your fingers search for the bee the pitch of that buzz rises. I guess she is becoming more insistent about her task.

Although we try to be gentle and deliberate as we inspect our hives there is the moment when we drop something – a frame slips and lands on the top bars; the hive tool clanks down on them; the top bangs down as it slips from our fingers. Just listen to the hive then. It's not just one annoyed bee; it's a chorus of annoyed bees. The sound they make is sudden but it slowly ceases. It then seems to be a reminder that if the disturbance is over all is well.

A sound that signals spring in the apiary is one that beekeepers do not like to hear It's the early afternoon of a warm sunny day and the hum of bees working is drowned out by the hum of thousands of bees leaving home all at once – a swarm. The sound is short-lived, just heard while the bees assemble and fly off. It's a happy sound as far as the bees are concerned but a discouraging one for the beekeeper

There is another bee sound that is not a happy one for the beekeeper or some of the bees. During certain times one colony, or even more, go on a robbing spree. The apiary sounds busy, but it is the wrong kind of busy. One or more weak colonies are having honey stolen. The robbers are quick and determined. That particular hum needs beekeeper attention.

The hum of the colony is put to good use during Winter months when the bees are confined and the weather is cold. Are the bees still alive? Where are they? Still low in the hive or have they worked their way up to the top of the top brood chamber? Bend over so your ear is close to the hive and give it a thump. An answering hum says: "yes, we're alive." Listen for the source of the hum – low or high in the hive. If they seem to be near the top perhaps some food is needed.

Queen piping is one of the more interesting sounds of the colony Since these noises – piping, tooting and quacking – are not directed towards the beekeeper or any of the beekeeper's actions, we may sel-

dom hear them. If you have ordered several queens and are keeping the cages together for a few days, before introduction into hives, you have surely heard their piping messages to each other We may hear that piping during swarm season from the queens confined in their cells. But, of course, we have to open the hive at the right time.

The sounds of honey harvest are multiple. We need to start with removing the honey supers. Those using a bee blower will be used to the racket coming from the little engine. A fume board will only produce a quiet hum as the bees descend from the supers. However, if you are still in the shake and brush method of bee removal you should listen closely An ordinary hum might turn into a noisy, unhappy hum. Some colonies really object to someone removing their honey. The sounds can tell whether you should switch to another method of chasing the bees out.

The next step in honey harvest would be the uncapping of the frames full of honey An uncapping knife gives us the occasional floop of cappings into a container If it is an electric knife you might hear the sizzle of honey scorching on the blade. Work faster! Scorched honey is not what you want for your customers. Some hobbyist beekeepers prefer using the cappings scratcher to uncap. This tool gives us a sticky smacking sound as the scratcher is pulled upwards to remove cappings. You say you are mechanized? Then you will hear the chatter of chains or reciprocating blades. These sounds will drown out the noise of cappings falling into the tank.

Next comes the thunk and a bit of a rattle of frames being put into the extractor Extractors themselves make a certain noise depending on size and whether hand-turned or with a motor

The sounds change from the time the extractor starts to when it reaches full speed. There's another sound that is pleasant to a beekeeper Listen carefully You will hear the sound made by the honey hitting the wall of the extractor It is another sound hard to describe, but it is a satisfying one. Honey running from the extractor into a settling tank produces a very quiet sound. Listen closely for that one. The job of extraction is done. Now you will hear the sounds of splashing water as all the equipment is being cleaned up.

During uncapping and extraction you may hear "people sounds." The yell as the bucket or settling tank is about to overflow. The groan as someone discovers the frame that fell apart during extraction. The sticky splat made by the shoe sole that inadvertently stepped on some honey

Of course there are the sounds made at other times of year We buy equipment and hammer the nails into the wood. The banging sounds are broken only by our howl when we hit our finger Wax foundation is very quiet as it is handled and installed. But the plastic rattles in the box as we select a piece. If you install plastic foundation into a wooden frame you will hear a very satisfying snap! as it settles into the grooves.

Beekeepers store wooden boxes – honey supers, hive bodies – so the sound of stacking wooden boxes is a familiar sound of beekeeping. However, nobody pays any attention to that. The radio is usually playing. Turn it off for just a few seconds (during a commercial) and listen.

Of course if you are a migratory beekeeper you are used to the sounds of bobcats and idling truck engines, tires going through mud, accompanied by the background hum from the hives as they are picked up and set down.

Take some time and stop and listen to all the varied sounds of beekeeping throughout the year In particular, listen to your bees. They have much to say

Wait! There is one last sound. The unmistakable crunch made by your smoker as you run over it with your truck. BC

Ann Harman listens to her bees in Flint Hill, Virginia.

Small Cell 4.9 mm
Fully Drawn, Full Size, Commercial Style Brood Frames
- Suppress Varroa Mite without chemicals.
- Shorten Emergence Times.
- Reduce Drones.

866-343-7191 www.smallcellbees.com

BREEDER QUEENS
VSH Russian Carniolan
Cordovan Minn. Hygienic Italian
Instrumentally Inseminated
$100 plus $45 shipping UPS Next Day
GLENN APIARIES
P.O. Box 2737
Fallbrook, CA 92088
(760) 728-3731
queenb95@aol.com
http://members.aol.com/queenb95/

For Your Queen Needs Call
Queen Cells Available – Shipped By UPS
MIKSA HONEY FARMS
David & Linda Miksa
13404 Honeycomb Rd. • Groveland, FL 34736
Ph. 352-429-3447
EMail miksahf@aol.com


Clear Material
MasterCard & Visa Accepted
Plastics Packaging Concepts
Honey Angel
12 oz. Capacity
(14 oz. net wt.)
Available in LDPE and Clear.
- John 3:16 Engraved on back
- White caps available
- Custom Labels – 20 characters per line
- 5 Lines Maximum

P.O. Box 617
Garden City, MO 64747
816.862.8703 or
FAX 816.862.8702
www.ppc3.com

MAXANT
WORLD'S FINEST STAINLESS STEEL HONEY PROCESSING EQUIPMENT
www.maxantindustries.com
sales@maxantindustries.com
978.772.0576
MASSACHUSETTS – USA
WORLD FAMOUS

Late Blooming Bulbs For Bees

Connie Krochmal

Camassia cusickii

Spring brings a profusion of flowers for honey bees, including hardy bulbs. In addition to these early flowering species, there are a number of late blooming bulbs that are favored by bees. All need full sun for best results.

Camassia (*Camassia quamash*)

Also known as bear grass and camas, this native wildflower is hardy to zone four With long, strap-like leaves, this reaches one to two feet in height. The dainty white or blue blooms form foot-long terminal clusters. Resembling lilies, these have six petals. They're an inch long. Camassia blooms emerge during late June and July

These plants can be propagated by seed. The bulbs should be planted four inches deep and four to five inches apart. They prefer a moist, well drained, loamy soil.

Camassia blossoms provide nectar and pollen.

Dahlias (*Dahlia spp.*)

Very carefree, dahlias bloom nonstop from mid-Summer until frost. Because they're only Winter hardy to zone nine, the bulbs need dug and stored for the Winter when they're grown in cold climates.

The thick, opposite foliage is often compound. Among the most floriferous of the Summer bulbs, dahlias have daisy-like blooms. The plant height can range from six inches to eight feet, depending on the variety

The flowers come in a wide assortment of colors. These include white, cream, pink, red, purple, yellow, and orange as well as bicolors. The taller varieties have blooms that are nearly a foot across.

There are literally hundreds of dahlia varieties. For bees, choose ones with single-type blossoms, such as Mignon, which is 1½ feet tall. The orchid and water lily dahlias also have single blooms.

Dahlias do best in a rich, well drained, slightly acidic soil. Plant the tubers about 10 inches deep and several feet apart. The taller ones will need to be staked at planting time.

Bees collect nectar and pollen from dahlias.

Fall crocus (*Crocus spp.*)

Though the Spring blooming crocus are the best known, there are at least 10 species that bloom during the Fall.

These pretty much resemble regular Spring crocus. The grass-like foliage often has a white stripe down the center The Fall blooms sometimes appear before the foliage. Fall crocus are three to six inches tall. The hardiness can vary somewhat, depending on the species.

Very adaptable, Fall crocus don't require a rich soil. Plant these bulbs two inches deep and four inches apart.

Among the Fall blooming crocus species are the following.

Kotschy's crocus (*Crocus kotschyanus*) is hardy to zone five. The rose-lilac blooms have dark colored veins. The centers are either yellow or orange. The petals reach two inches in length.

Mignon Dahlia

Ligurian Fall crocus (*Crocus medius*) is suitable to zone six. Deep purple, the flowers are 10 inches tall. They're accented with darker veins. Their most conspicuous feature is the red stigmas.

Long flower crocus (*Crocus longiflorus*) is hardy to zone five. These vivid purple blooms have yellow throats. The petals, for which the flowers are named, are up to 5½ inches long.

Saffron crocus (*Crocus sativus*) survives Winters in zone six. The very expensive spice, Saffron is derived from the red stigmas. The scented blooms range in color from pinkish-purple to white.

Showy Fall crocus (*Crocus speciosum*) thrives to zone five. Its blossoms are two inches long. Depending on the variety, these are either white or lavender They have purple veins. This tends to bloom earlier than the other Fall blooming crocus.

Bees eagerly work all of the Fall crocus for nectar and pollen.

Giant Summer snowflake (*Galtonia candicans*)

A member of the lily family, this is also known as Summer hyacinth.

Hardy to zone six, giant snowflake should be dug in the Fall and stored in a frost-free area when grown in colder climates. The thick, fleshy, strap-like foliage is two inches wide and up to three feet in length.

Giant Summer snowflake is best known for its nodding, white, bell-like blossoms, which are 1½ inches long. These have showy dark stamens. The blooms crowd together on a tall stalk, which can be three to four feet tall. A single flower spike can contain nearly three dozen blooms. The blossoms open in July and August.

This species prefers a rich, well drained, light soil. It adapts to a wide variety of pH levels from acid to neutral. Plant the bulbs six to nine inches deep. Giant Summer snowflake can be propagated by seeds, offsets, and bulbs.

These flowers bring nectar and pollen for bees.

Meadow saffron (*Colchicum spp.*)

Also known as Autumn-crocus, these crocus look-alikes are members of the lily family. Basically, the plants resemble very large crocus.

The grass-like foliage of the fall blooming meadow saffron dies back during late Spring and Summer In late Summer and Fall, the flowers begin to make their appearance. Up to eight inches across, these tubular blooms have six segments. They emerge over a period of several weeks. Typically, these are light pink, lilac, or purple. However, there are varieties with white or red blooms. The large flowers open on leafless stems that can be eight inches tall.

Meadow saffron thrives in a rich, light, well drained soil. However, the bulbs adapt to other situations so long as the spot is well drained. They tolerate any pH from neutral to acid.

These species are propagated by seed, division, and offsets. Plant the bulbs three to four inches deep and about 10 to 12 inches apart. Shipped during late Summer, these should be planted as soon as the shipment arrives.

The best species of meadow saffron for bees include the following.

Alpine Autumn-crocus *Colchicum alpinum*) is hardy to zone six. This is only four inches tall. The rose-purple blossoms begin opening in August. They're an inch in diameter

One of the most popular of this group is the common Autumn-crocus *Colchicum autumnale*). It is hardy to zone four Also called meadow saffron, this reaches six inches in height. Up to five inches in diameter, the flowers are mostly pink to rose-purple. However, pink and white flowered varieties are also available. Sometimes, ones with double flowers are sold. So, be sure and get single-flowered ones for the bee garden.

Byzantine autumn-crocus (*Colchicum byzantinum*) Hardy to zone six, this grows to six inches tall. Especially floriferous, Byzantine Autumn-crocus can have nearly two dozen purple blooms at a time. These open on long, white tubes.

Showy Autumn-crocus (*Colchicum speciosum*) thrives to zone four This is the tallest species, growing to around a foot. The name refers to the huge blooms, which are over six inches in diameter Appearing on white tubes, the flowers darken as they age. Though they're typically rose-purple, other colors are sometimes available. Very free flowering, this begins blooming in August.

Bees work all of the meadow saffron species for nectar and pollen.

Ornamental onions (*Allium spp.*)

Quite a few of the ornamental onions bloom during the Summer months. These grow from six inches to five feet in height. Though the plant can have a faint onion-like aroma, this occurs mostly when the leaves and flowers are crushed. Typically, the small, star-shaped blooms open in rounded clusters.

Ornamental onions must have a well drained soil. These are propagated by seeds, bulbs, and division. They often self-sow. The proper planting depth for these bulbs is three to four times the height of the bulb.

Allium sphaerocephalon

Recommended Summer flowering species for bees include the following.

Blue flowering onion (*Allium cyaneum*) is hardy to zone four This can reach a foot in height. Native to China, it has very narrow foliage. The pendant, bell-like blooms are purple with blue stamens. Very small, these only reach one-fourth inch in length.

Corkscrew ornamental onion (*Allium senescens*) thrives to zone three. This can be one to two feet in height. The short foliage has a twisted appearance, which accounts for the name. Usually red or purple, the blooms appear on crowded umbels in late June and July There is also a pink flowering variety After the blooms fade, the flower heads sometimes produce bulbils, which can be planted.

Drumsticks (*Allium sphaerocephalum*) is recommended to zone four Flowering freely, this is three feet tall. The narrow, channeled foliage resembles grass. Its small blooms, reddish-purple to deep purple, open in July and August. Appearing on tall spikes, the flowers form dense, ball-like clusters for which the plant is named.

Keeled garlic (*Allium pulchellum*) is hardy to zone five. This can reach two feet in height. The long, narrow leaves are 1½ to two feet in length. The small, nodding flowers are usually pink, purplish-red, or yellow A variety with white blooms is also available. The blossoms form loose clusters.

Yellow flowering onion (*Allium flavum*) is suited to zone four It grows to about two feet in height. However, there are dwarf varieties. Starting in late June and early July, the blooms emerge in loose umbels. These bell-like, yellow blossoms are less than one-fourth inch long.

Bees collect nectar and pollen from all of these flowers. The resulting honey doesn't smell or taste like onions.

Peruvian lily (*Alstroemeria spp.*)

Also known as lily-of-the-Incas, several species of these bulbs are in cultivation. Related to amaryllis, they're native to South America. Most Peruvian lilies are Winter hardy to zone eight and higher Elsewhere,

they should be dug before the first frost and stored for the Winter These usually start blooming during mid-Summer

The bulbs should be planted six inches deep and a foot apart in a rich, well drained soil. They adapt to a variety of pH conditions from acid to neutral. Divide only when needed.

There are several species that are suitable for bees, including the following.

Golden lily-of-the-Incas (*Alstroemeria aurantiaca*) is hardy to zone seven. This grows to three feet tall. It tends to be evergreen in sub-tropical climates. The distinctive, tubular shaped blossoms are orange or yellow These have colorful blotches, usually green, red, or brown. During the Summer, they open in large clusters with 30 or so flowers per bunch.

Inca lily (*Alstroemeria pelegrina*) is the tenderest of the alstroemerias, hardy only to zone ten. Native to Chile, this reaches two feet in height. It has short, lance-shaped foliage that is only two inches long. The blossoms, which resemble those of azaleas, are up to two inches in length. They're usually lilac with red and purple spots. However, a number of varieties are available, including ones with white, pink, yellow, orange, and cream blooms. Forming clusters, these open on tall stems, up to four feet in height.

Parigo Charm Peruvian lily (*Alstroemeria ligtu*) is three to four feet tall. With colorful blotches, the trumpet-shaped, striped blooms come in a wide assortment of colors. These range from pastel pink and white to salmon and orange.

Parrot alstroemeria (*Alstroemeria pulchella*) is hardy to zone eight. Native to Brazil, this has deep red blooms with dark splotches on the inside. There are touches of green along the tips. It blooms during the late Summer and Fall.

All of the alstroemerias are eagerly worked by bees for nectar and pollen.

Tiger flower (*Tigrida pavonia*)

Also known as Mexican shell flower and flower of Tigris, this is related to the iris. Tiger flower is hardy to zone six. Elsewhere, it is planted in the Spring as a Summer bulb and lifted for the Winter months.

Native to Mexico, this species is one to 2½ feet tall. The sword-shaped foliage is narrow, reaching 1½ feet in length. Tiger flower has pleated, richly textured leaves.

The iris-like blossoms appear during July and August. Tiger flower is named for the spots, which are concentrated mostly towards the centers of the blooms. Opening on two-foot-tall stems, the cup-shaped flowers are three to six inches across. They come in assorted colors. These include white, pink, red, purple, yellow, and orange.

Plant tiger flower bulbs three to four inches deep and five to eight inches apart. These do best in a rich, well drained, sandy soil. This species is suited to most any pH from acid to neutral. The plants are propagated by division, offsets, and seeds.

These flowers provide nectar for bees. BC

Connie Krochmal is an award winning garden writer and a beekeeper in Black Mountain, South Carolina.

Comb Honey
Production at it's finest
ROSS ROUND SUPERS

$49.00 + shipping
After $8.00 Manufacturer's Rebate

Just add 3-7/8" thin foundation and you are ready to go - 8 sheets/$2.00

MAYSPECIALS
GREAT PRODUCTS – GREAT PRICES

SUNDANCE POLLEN TRAP
Perhaps the finest pollen trap on the market. Pollen tray opens to the rear and has a cover to keep hive debris out of the pollen. Stainless screen and has a simple switch for collection or non-collection.
$62.00 each + shipping

ALL NATURAL
MITE TRAP BOARD
Research has shown that 40 - 60% of varroa mites fall to the bottom board naturally or when you open your hive and smoke it. These mites just crawl back up and hop on to a host bee. With our trap these mites are trapped and die. You can check or reapply grease to tray without opening your hive.

This heavy galvanized screened trap allows mites to fall through and be trapped on the tray. The unique tray and trap design is much better than others that are available.

Simply rotate your bottom board to face the opposite direction and place trap facing the original way.

Tray slips in the opening of the bottom board which is now in the back. Simply pull tray out and regrease or put in new sticky board without disturbing or opeing the hive.

$16.75 + shipping

email bbhoney@acegroup.cc

B & B HONEY FARM
5917 Hop Hollow Rd., HOUSTON, MN 55943 • FAX 1.507.896.4134
ORDER LINE 1.800.342.4811 INFORMATION 1.507.896.3955
www.bbhoneyfarm.com

GLEANINGS

MAY, 2008 • ALL THE NEWS THAT FITS

OBITUARIES

Richard E. Barkman was born September 17, 1935, the second son of Esra and Emilie Barkman. He had two brothers, Paul and Jim, and a sister, Lucy. He was raised in a Christ centered home, with daily family devotions and prayer. Esra was a Mennonite Brethren Preacher.

Rich grew up on a farm three miles south of Hillsboro, KS. The children went to Ebenfeld, a one-room eight grade grammar school, across the road from Ebenfeld Church. Rich graduated from Hillsboro High School in 1953, and spent his 1W service at Fitzsimmons Army Hospital in Denver, CO. He was a Guinea pig.

Richard married Joyce Brandt, June 16, 1960.

Together with his father he was a beekeeper all his life. They started the Artesian Honey Producers, in Artesian, SD in 1953. Then, founded Barkman Busy Bee Honey Company in Hillsboro, in 1963, which has become one of the largest honey distributors in the U.S. Rich and his father worked together in both businesses until his father's retirement. Both companies became third generation businesses when Rich's son Brent joined his father in the business. Father and son worked side by side, expanding the businesses and working to achieve the vision they followed, until Rich's illness made it impossible for him to continue.

Following a merger between Barkman Busy Bee Honey Company and the Stoller Honey Company of Latty, OH, the combined companies took on the name of Golden Heritage Foods, LLC. The Core Ideology of the company reflects the deeply held convictions of Richard, his business associates and his family: *We believe that it is our core purpose to serve God with all resources entrusted to us, enlarging our territory of influence through wise stewardship and servant leadership.*

Richard was preceded in death by his parents, Esra and Emilie Barkman and his older brother Paul.

Rich left behind his wife, Joyce, his son, Brent (Lynette) Barkman, and daughter, Carmon (Ken) Jones, of Hillsboro.

Go Green with a Russian Queen℠

Certified Russian Queens

Quality Russian Queens for Hobbyists, Breeders, Honey Production, and Practical-Sustainable-Organic Beekeeping

For details, prices, and availability please visit
http://www.mybeebusiness.com
Or call 336 543 7734 or 336 342 4490
Norton's Honey Farm– Chuck Norton
330 Irvin Street Reidsville, NC 27320-3648
Member: Russian Honeybee Breeders Association, Inc.

FOOD SAFETY?????

My bees don't think so, says Jeff Anderson, of MN who has lost countless bees to pesticide poisoning.

SARE GRANTS FOR 2008

Testing two selection assays' efficacy for *Varroa*-mite-tolerant bee production – Adam Finkelstein, Frederick MD: Comparing mite-tolerant queen lines with a normal line to see if selective breeding can reduce pesticides, improve pollinator health, and reduce labor through fewer treatments to fend off CCD. Outreach will be through producer meetings, presentations at regional and county gatherings, and through a web site. $4,347

A middle entrance for beehives – David Stewart, Dorothy NJ: Testing a new idea of relocating the entrance to the hive so that it is above the brood and below the honey, which may tend to reduce the number of *Varroa* mites as compared to a conventional bottom-entry hive. With both, mites fall off the bees and land on the bottom board; perhaps if the entrance is placed higher, the mites cannot reattach to a different bee. Outreach will be through a producers' association and through a newsletter. $7,556

Food-grade mineral oil and thymol fog application as a natural alternative to treating honey bee mites – Heather Kyser, Beemus Honey, Bemus Point NY: Investigating whether a fog form of mineral oil and thymol, a natural plant extract, can be used as an alternative pesticide in a cost-effective, environmentally sound way. The results of the project will be disseminated through a producer publication, extension, a county association, and an on-farm demonstration. $7,556

Honey bees: To overwinter or not – Craig Cella, Loganton PA: This two-year project will explore new overwintering techniques, including whether it is more cost- effective to simply install new bees each Spring, and whether overwintering techniques can affect mites and viruses. Outreach will be through producer publications, grower meetings, and local beekeeping classes. $7,500

Tobacco treatment for *Varroa* mites on honey bees – Robin Kugler, Boyertown PA: Exploring whether tobacco leaves can reduce mites, mostly likely through bioprocesses that are already approved for mite treatments but are time-consuming to administer. The goal is to see if there is an easier approach to mite control that uses local, natural materials, and to quantify the effects. The results will be shared through a beekeepers' association and through a producer publication. $7,757

OBITUARIES

Allen Reed Luce, 84 of Valley Center, died Tuesday, March 18, 2008 in Escondido.

Mr. Luce was born May 14, 1923 in Hinton, Iowa. He lived on farms in Iowa and South Dakota before moving to San Diego in 1937.

Mr. Luce graduated from San Diego High School in 1941 and then attended San Diego State College. He served in the Army Air Force as a navigator during WWII. After his military service, he continued his education and earned his Bachelor of Science Degree in General Agriculture in 1949 from the University of California at Davis.

After graduating from UC Davis, he moved to the island of Molokai, Hawaii where he managed a bee operation for Molokai Ranch. In 1953, he started the Hawaiian American Honey Company on the big island of Hawaii. Later he worked in the Bee Biology Department at UC Davis for seven years. In 1973, he returned to the big island of Hawaii where he was the General Manager for Power's Apiaries, one of the largest honey producers nationwide. He was a beekeeper in Hawaii for 30 years.

Albert George Knoefler was born October 25, 1921 at Clyde, Texas. He was the eighth of nine children born to George and Lois (Crouse) Knoefler. He died February 15, 2008 at Norco, California. He was 86 years old. At the time of his accidental death he was loading bees for California's almond pollination. He was crushed between a tractor trailer and a two-ton bobtail truck.

Albert was a WWII Army Veteran. In 1948, Albert married Iva Nette Ruf at La Sierra, California. Six children were born to this union.

Albert came with his parents to the La Sierra area of Riverside in 1922 as a one-year old pioneer of the area. As a young man, Albert engaged in truck farming, raising both flowers and produce near the current Knoefler Drive named for his parents. Along with six of his seven brothers, all second generation beekeepers, he made honey production and pollination his vocation from the 1950s until his death.

He was a well-known California beekeeper with additional operations in Nebraska, North Dakota, and Mississippi. He was knowledgeable of his art. Many people currently involved in apiculture worked with Albert when they were young. He employed students through the La Sierra campus of Loma Linda University. He was a life-long member of the Seventh Day Adventist Church.

He enjoyed helping people and he loved to work. In his later years, he could out-work younger persons and just couldn't seem to retire. At the time of his death he was still caring for 2,000 beehives and the Albert G. Knoefler Honey Company in Riverside, California. He was assisted by his son, Lloyd Knoefler.

"An Association Strictly For Beekeepers"
THE AMERICAN HONEY PRODUCERS ASSOCIATION

The AHPA is the **only** national beekeeping organization that reserves its voting privileges for beekeepers. All segments of the honey industry are welcome, but only our beekeepers have a vote in the organization.

Join and Help us:

★Promote U.S. Honey ★Promote Bee Research ★Stop Pesticide Abuse Near Bees ★Educate Congress of our Beekeeping Needs ★Keep the Beekeeping Industry Updated with our *Honey Producer* Publication

Dues: Hobbyist - $50; Sideline $150; Commercial $300

Make checks payable to: AHPA
Ellen Smoot, P.O. Box 158
Power, MT 59468

NEW JERSEY GIVES BEES

The NJ Department of Ag offered $300 worth of beekeeping equipment and bees for first-time beekeepers who successfully completed a three-day "Bee-ginner's Beekeeping" course offered by Rutgers University's NJ Agricultural Experiment Station Office of Continuing Professional Education.

Participants must be NJ residents, over 10 years old, and register their apiary with the Department of Agriculture's Division of Plant Industry.

"With continuing threats to our honey bee population, we hope this cooperative venture will result in more beekeepers to help sustain the fruit and vegetable farmers who depend on honey bees to pollinate their crops," NJ Secretary of Agriculture Charles M. Kuperus says.

"Honey bees are vital to NJ's fruit and vegetable industry through their pollination of crops, such as apples, blueberries, cantaloupes, cranberries, cucumbers, squash and pumpkins, which account for about $200 million in revenue each year."

The program is funded by a grant from the Department of Agriculture's Division of Agricultural and Natural Resources. The first 50 people to meet the requirements were able to purchase up to $300 of beekeeping equipment and bees from registered NJ bee supply dealers. Participants were not given cash, but had credit with the dealers, who then submitted itemized bills to the department for reimbursement.

The state apiarist and seasonal inspectors will periodically visit the new hives and provide technical assistance to the new beekeepers.

The new beekeeper program was first offered by the department in 2006, generating a large amount of interest. In addition to the 50 people who completed the Rutgers course and received the free equipment, 91 people attended the two Rutgers "Bee-ginner's Beekeeping" courses that were added that year.

Out of those who took the course that year, 72% reported they started keeping bees; 74% said they intended to add more colonies and, 78% joined the NJ Beekeepers Assn.

Association secretary-treasurer Curtis Crowell says his group has about 450 members.

"Our numbers showed a definite improvement stemming from the year of the first Beginning Beekeeper program, which occurred at the same time that a groundswell of media attention focused on the plight of honey bees world-wide," he says.

"The increase in beekeepers can only help farmers in NJ by adding to the pool of available pollinators so necessary for much of the food grown here, from blueberries and cranberries to vine crops and fruit trees." – *Alan Harman*

Bees Return To Davis

A noted honey bee stock developed 18 years ago by internationally known honey bee geneticist Robert Page Jr., formerly with the University of CA, Davis and now at AZ State Univ., will return to the Harry Laidlaw Jr. Honey Bee Research Facility at UC Davis, the university says.

All 50 hives of the strain, a specially selected high and low pollen hoarding genetic stock spanning 32 generations, will relocate to Davis and "will pave the way for future genetic research here," says Walter Leal, professor and chairman of the Department of Entomology.

"This stock is the most studied, most valued honey bee research stock ever," says Page. To date, studies by some 30 scientists have generated more than 50 published papers, focusing on behavioral traits, learning behaviors, sensory response and insulin signaling paths. Much of the research occurred when Page and bee geneticist Kim Fondrk were based at the Laidlaw facility from 1989 to 2004.

"All the stock production and maintenance will be at Davis," says Page. "All the colonies have queens that were instrumentally inseminated, and come from completely controlled matings traced back to their origins at UC Davis. We know they've never been contaminated by Africanized bees, for example. Kim Fondrk, who just retired as ASU honey bee research program manager, will produce stocks (queen bees) for use in Arizona for our research."

Page, a 15-year UC Davis Department of Entomology faculty member who chaired the department from 1999 to 2004, retired as an emeritus professor in 2004 to accept his current position as the founding director and foundation professor of the ASU School of Life Sciences.

With the impending hire of a pollination biologist and the recruitment of the Häagen-Dazs Postdoctoral Fellow, Leal predicts the department "will soon reclaim the status of the premier pollination biology program in the country. Harry Laidlaw would be proud to know the Honey Bee Research Facility will soon be operating in full capacity with world-class research on native and European honey bees."

Display Advertisers

Lady Truck Driver With A Pit Bull

Ed Colby

In March I was going to rent my 300-square-foot studio apartment to a Swedish lady truck driver with a pit bull, but when that fell through, I leased it to a drummer in a rock and roll band. I hope the neighbors don't mind.

I advertised this place as a "carriage house studio." It sits over the garage behind my house, and Linda used that space to teach class piano. She had two grand pianos and nine uprights up there.

Then my world got turned upside down. I went from having a wife and no mortgage to having a mortgage and no wife. When Linda and I settled, buying half the farm didn't come cheap. From the git-go I planned to put in a kitchenette and rent out the studio. I knew I wasn't going to make the payments on ski patrol wages and 60 bee hives!

Fortunately for me, this is a landlord's market. Garfield County sits atop one of the richest natural gas deposits in the country, and the drills are pumping. Add to this our proximity to Aspen. The tourist Mecca offers a myriad of good-paying jobs but sky-high rents, so people commute from where they can afford to live.

Last July I rented to a social worker who moonlighted as a rock guitarist. His wife had just left him, so we'd sometimes drink a beer and commiserate. Six weeks ago he told he was moving in with his new girlfriend.

There was a misunderstanding over a cleaning deposit, but that's why owners hold deposits. I hired a Polish cleaning lady to make things right. When I asked her how much, she said, "I give you a price, and we argue, OK? I'm Polish." Four hours later, the mysterious stench was gone, and you could have eaten off the floor

When I gave her a couple of small honey jars for a tip, she was ecstatic. She told me her family mailed her Polish honey, because it's the best. She said the shipping cost more than the honey, but that she didn't trust honey from the store.

When I advertised my studio in the paper, the phone rang off the hook. I could only interview prospective tenants on my two days off, because the rest of the time I stay in Aspen in my rent-free but cozy chateau. My March days-off get pretty well taken up by bee chores, including getting the little darlings ready to pollinate the apricots and sweet cherries in Grand Junction. So I had to make time to show the studio.

I wasn't about to rent to a couple, because how are two people going to live in 300 square feet? They'd go crazy and move out, and then where would I be?

Kjella said, "Single? That's me all right." I liked her immediately She drove a water truck for the natural gas rigs. She didn't wear pink lipstick. She was about as blue collar as you can get. And her smile lit up a room.

On my tenant questionnaire, the last query was, "Are you allergic to honey bees?" Kjella answered, "I don't think so."

But she really won me when she said, "Would you want me to cut the lawn for you?"

At the last minute, she mentioned the pit bull. I said, "I'd like to meet the little rascal."

"Seeshaw" was in her pickup. She seemed harmless enough. And Kjella said she took Seeshaw with her everywhere. When I told her I wanted an extra damage deposit for the dog, Kjella said, "No problem."

Her references were stellar Her boss said she had a good work ethic. The manager of the camper park where she stayed said she always paid the rent on time.

But when I told Kjella, "OK, you can have it," at first she said, "My boss'll send you the deposits." I said fine, but then she called back and said the boss was backing out. Kjella wondered if she could "work with me." I learned that she was missing a lot of job hours due to washed out roads and delayed drilling permits. Things would get better soon, of course. "I came here to get rich," she said. But I had this sinking feeling.

I said I'd call her back. Now gentle reader, I have problems of my own. I really didn't want to take on somebody else's. Not when I had another tenant, with another dog, waiting in the wings – the drummer boy

All Winter I worried about my pipes freezing while I'm up in Aspen. I have an empty bedroom –freshly painted the faintest baby blue – and I thought I might be smart to find a responsible person to move in with me. Of course I never got around to seriously looking for one. Maybe it's because I'm not in college anymore. I'm 60 years old.

But when I called Kjella back, I said, "Look, I've got some bad news, and I've got some good news. First, the bad news: You can't afford to move in, and I'm not going to rent you the studio, but don't hang up, OK?"

She didn't hang up.

"I've got a spare bedroom I'd rent a lot cheaper," I said. "You'd have more money in your pocket, and you'd mostly have the place to yourself. I wouldn't harass you like some guys might. I like dogs. Do you want to take a look?"

There was a long pause on the line. She said she'd think it over and let me know, but she didn't sound that enthusiastic.

That was two weeks ago, but I still haven't heard back from her

BOTTOM BOARD