APR 2009

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INSIDE . . .

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Just starting out and don't want to extract? Want another product to sell? Like a little variety in your harvest? Or, do you just love cut comb honey? Take a look at how easy it is , on page 50. (photo by Bob Darrell)

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

APRIL 2009 VOLUME 137 NUMBER 4

FEATURES

DEPARTMENTS & COLUMNS

GLEANINGS-73, CALENDAR-76, CLASSIFIED ADS-77

Hobby or Commercial

I have two hives at something of a urban/suburban boundary. I have referred to myself as a small suburban beekeeper. Another label could be non-commercial beekeeper. (I am certainly not in it for the money.)

Part of the confusion is that we are blurring two indexes here, size and profitability. The implicit assumption is that a two hive apiary is too small to be profitable and 1000 hives are too expensive to be maintained as a hobby. I suggest that the way the current categories are used actually are levels of commitment. The hobbyist may not be all that committed, the sideliner is committed but not full time, and the commercial beekeeper is committed full time. This works except that some hobbyists are true diehard devotees.

I resolve this by turning back to Ann's article. The context in which she asks about needing better categories is communicating with legislators. I submit that legislators are focused on economics and scale (when they are not focused on getting re-elected. Therefore I suggest that what is important to legislators can be captured with the following three categories: Amateur (not for profit), semi-professional (a supplemental source of income), and professional (main source of income). These categories can be modified with adjectives such as small, medium, and large but I think the economic importance to the beekeeper is the core of what is important to government both for regulation and for research concerns.

Dennis Durham
Alexandria, VA

Enjoying Bee Culture

I have been getting *Bee Culture* magazine for over a year now. I am a beginning beekeeper with only six years under my belt. I have to say that I enjoy every issue more than the last. I especially enjoy the articles that address natural beekeeping.

I just received the January issue and found that I get a calendar! I am so pleased!

Felecia Smith
Fairgrove, MI

Managing Feral Bees

In response to a comment made in the January issue I would like to express concern. Robin Thorpe from UC Davis said "I am not a fan of blanket extermination of all feral bee colonies based on the supposition that they may be Africanized. If feral bees are not a threat to the public health, and can be removed and managed by a competent beekeeper, I do not consider this a backward idea. Feral colonies that survive in spite of the parasitic mite, *Varroa* and other diseases that damage many commercial colonies, may well possess genetic traits that can be valuable to breeding programs designed to build better commercial honey bee lines. Preservation of such stock, may indeed be of value in future to honey bee breeding programs."

Another beekeeper, owner of Headwaters Farms, David Mendes, said "Take the beekeeper out of the picture and nature's going to select for more aggressive bees. Only with human intervention the gentler bees can be managed. A healthy beekeeping industry is the only way to deal with that kind of species."

Sue Cobey said this also in her comment. She also said "genetic diversity provides the raw tools for selection."

I do believe a competent beekeeper can tell the difference between Africanized and gentle feral bees and then manage these hives as to continue to produce gentler bee colonies like we used to know.

Melinda Nelson
Garden Grove, CA

A Defining Moment

I read with interest and a bit of amusement, *A Defining Moment*, in the February issue. Bees have occupied an ever increasing place in my life for nearly 30 years. Starting with used equipment and a donated swarm, I've continued to increase colony numbers and will do so again this season. The article explores numerous possibilities for changing how we categorize beekeepers. If you look at all of the

terminology suggestions, regardless of colony numbers, the important and consistent term we all share..."we are beekeepers." Might I suggest simplicity?

Chris Sennott
Luther, OK

Pesticides Or Not

As a beginning beekeeper, I enjoy *Bee Culture*, and often your column. But today I am moved to ask: don't you read your own magazine?

On page 13 you claim, "pretty much everybody knows that CCD isn't caused by pesticides."

On page 20, the estimable Dr. Sheppard describes a study that suggests the serious effects of even low-level exposure to imidacloprid; he notes "there has been considerable speculation in the popular press and to some extent in the scientific press that exposure of field bees to neonicotinoids may be a factor in colony collapse disorder. The results of this study do not put this question to rest by any means..."

On p. 33, Dr. Connor reminds us that "there is growing evidence that varroacides...may leave residues in the hives... they appear to shorten the life of bees, reduce the production and fertility of queens and drones, and cause bees to die earlier."

From my reading – of your magazine and other sources – it appears highly likely that chemical contamination is, at minimum, a co-factor in increase of colony collapse. Glibly stating that CCD "is not" caused by pesticides seems to misrepresent even the research covered in your own publication.

Margot Boyer
Vashon Island, WA

Editor's Note: Thanks for the letter. I still contend that pesticides don't cause CCD. Absolutely they may contribute to the stress of a colony, and overall stress may be a contributing factor, but pesticides have been stressing bees since pesticides were invented. Nutrition, too has been a problem, drought, queenlessness, Varroa, tracheal mites. All are contributing factors, but none of them, by themselves, have been shown to cause CCD. The scientists agree too many colonies suffered CCD that were not exposed to out-of-the-ordinary amounts of pesticides in hive or agricultural. There may be a connection, but they are not the cause. Most researchers and beekeepers who study this now believe there is a trigger, probably a virus, that is allowed to go off once a colony is stressed by these factors, or the trigger is always there and one more problems lets it go.It is something biological, I am almost certain, because of the way it moves through beeyards and whole operations.

Now, that pesticides are causing problems goes without saying, and that this much attention has been drawn to both – bees and poison – has only been a good thing because beekeepers and chemical companies are looking again at what they are doing. And beekeepers are looking at what residues remain, and what, when and how they are feeding. All of these will help reduce the stresses on our hives. But when CCD leaves the scene, as it will I believe, pesticides will remain – killing bees no doubt, but not in the manner of CCD.

INNER COVER

If the past three years have taught us nothing, we should have learned that it's the fundamentals of honey bee biology, honey bee colony management, and honey bee pest control that we need to take care of if we are going to succeed at this endeavor. It's not the disease of the day or the new and exotic that cause the most problems for the most people most of the time. Some, yes. Absolutely. Some have suffered immeasurably the past couple of years because of the disease of the day, the new and exotic.

But you know, deep down, that it's when we abandon the basics, when we are late getting it done, when we ignore the warning signs, when we don't do what we know we are supposed to do because of time, because of the weather, because it's cold, dark, late, hot, in the way, too far away, too expensive, too hard, too long, too much, too messy . . . or just because.

This past Winter, here where my bees are, is a perfect example. As Winters go it wasn't all that bad. The Wisconsin Winters of my youth put this one to shame for long periods of cold, snow, wind, more cold, more snow and gray and cloudy weather that went on it seemed forever.

This year we had a Winter here that, according to some who've been here longer than I have, wasn't all that bad, wasn't all that different than the Winters of their youth. But from where I sit, it was a Winter worse than most, maybe worse than all I've seen here. Snow, long stretches of cold, wind, rain, more snow . . . the bees had a hard time with all this. They didn't get to fly much, couldn't move much, ate more food than normal . . . they had a plain old hard Winter. And a lot of them died because of it. They died because we didn't worry enough about their food, because we didn't get the wind breaks up in time, the mouse guards on, more feed on, didn't wrap when we could have, those that treat didn't get treatments on in time, didn't take care of the bees that take care of the bees that go into Winter . . . in fact we barely took care of the Winter bees at all.

It was too expensive, cold weather came too soon, we were too late, it was too hard, we had too much to do, we . . . well, we just didn't do the right thing at the right time the right way.

So this Spring, there's lots of empty wood, again. Empty because we didn't do it right. Not because of the disease of the day. Not because of some exotic and mysterious malady. Not because of a new and misunderstood problem. No. No excuses. None that hold water, anyway.

I hope we've learned our lesson. It's the basics. Flat out, no other way, do the right thing at the right time the right way and you'll most always do all right. So that's what I'm doing from now on. Or trying to do anyway.

Don't you think it's time we went back to what we know how to do, and simply do it? A bit ago I made the statement that beekeeping has changed more in the last three years than in the last 20. And you know what, it's true. What we've done is . . . we've gone back to the tried and true, to the ways that work, to the basics . . . listening to the sounds of the honey bee song, the rhythm of the seasons, the beat of the dance and the buzz in the hive that's telling us what to do and when to do it, and that it will be all right when we do. Can you hear it? Listen. Listen. Your bees can hear.

•

In early March I had the opportunity to travel to the combined meeting of the South Carolina and North Carolina State Beekeepers' meeting in Rock Hill, South Carolina. They do this every other year, switching states when they do. It is the same weekend that the big Ohio meeting takes place, but it seemed a lot more fun than that meeting. Not that the Wooster meeting isn't fun . . . but I've been there a lot, and I haven't been down south nearly as much as I'd like to be. And those Carolina beekeepers know how to have a meeting.

There were over 500, nearly 600 beekeepers at this day and a half event, along with a large group of vendors. I think more would be there if they knew of this greatest kept secret in the south, and I suspect more will be showing up once they know how may eager beekeepers are there. That's what happened at Wooster, once we told the world about it. They went from large to supersize real quick when word got around.

This Carolina group does it a bit differently though. They started Friday afternoon with a few lectures by speakers like Jerry Hayes, Apiary Inspector from Florida, Dave Tarpy from North Carolina, a state Senator and then a panel of all the speakers for the weekend including Dave, Jennifer Berry from Georgia, Mike Hood from South Carolina, commercial beekeepers from both states and all the rest. They even had me on the program. It was a Q&A session that worked great because there were beekeepers, bee scientists, regulators, and other experienced folks on hand answering questions so you got the whole perspective of the answer to any question that came up. This is similar to the Ohio meeting but with more speakers.

That evening they had a great banquet and a band and a keynote speaker and called it a night early. And they started early the next day with more lectures . . . Dave Tarpy, Stan Schneider . . . an EAS Hambleton Award Winner no less, Jerry Hayes, playing it to the hilt in his *Ask The Expert* role he does so well in the *American Bee Journal* . . . and then a long leisurely lunch and time to visit the vendors.

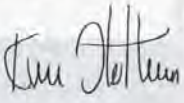
That afternoon they ran six different workshops at the same time, . . . three times in a row, so at the very best you could only take in three. It was a challenge to get to as many as you could, but folks tried.

Mike Hood was in charge of the meeting and he kept it on time, in tune and focused. And he had a lot of help from the local association members running things. No guessing games. No honey show. No contests. Just beekeeping. Just beekeepers. Nothing fancy, nothing expensive, nothing you didn't need.

Nice job Mike. Nice job Carolinas. This is a meeting I'd like to come back to. Maybe you should think about it next time, too.

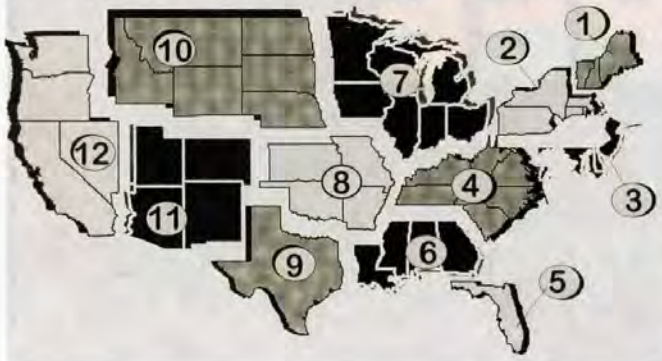
•

April showers, May flowers, all that . . . you'll need your hive tool sharp and your smoker lit to get it all done the right way at the right time this month. Get moving.



Back To Basics

APRIL – REGIONAL HONEY PRICE REPORT



Again this year we polled our reporters on where they sell their honey. We've been doing this for several years and have developed a fairly predictable pattern. Our reporters are mainly sideline beekeepers, but we have a good representation of (amateur, parttime, backyard – take your pick), and a few commercial outfits in the mix.

Because our reporters are similar in scope and operation the sales outlets they have available are similar. Nevertheless, look at the list and see if there's something there that you are not taking advantage of that you could, or that you could expand on if you want to increase sales.

The number of beekeepers who sell honey from home continues to inch up so this method must be improving, but the amount of honey sold there remains stable. Internet sales this year took a nosedive for reasons unknown, but the number of beekeepers selling there bumped up a bit.

The big winner this year is the number of beekeepers selling honey at local farm markets. This face to face and local selling is becoming increasingly popular as localvores and knowing where your food comes from moves to the front of many shopper's concerns. Check out farm markets for your sales this year. Right along with that is the increase in both numbers and pounds sold at organic and health food stores. People are worried about their food. Help them out.

% of Reporters Selling at these locations						% of Their Honey Sales at these locations						Locations Honey Sold at
2004	2005	2006	2007	2008	2009	2004	2005	2006	2007	2008	2009	
68	78	69	65	76	82	40	35	33	46	44	40	Home (inside or roadside stand)
17	14	13	16	16	20	23	41	49	26	37	34	Local community - sponsored farm market (i.e. Sat. & Sun. sales)
24	21	30	37	16	26	23	14	17	32	32	26	Local Farm Market business that's seasonal (Fall only, for instance)
19	18	16	18	18	26	32	34	17	25	39	36	Local Farm Market business that's year-round
5	6	18	5	10	8	6	23	5	44	30	29	Flea Market
28	41	28	24	34	39	28	14	20	19	20	26	Health Food/Organic store
15	17	10	10	13	11	23	9	7	14	5	11	Gift Store
23	29	23	15	14	20	22	16	16	25	25	16	Bakeries/Food Establishments
14	11	5	4	9	15	18	23	5	21	19	15	Local High-End Retail Outlets (gourmet stores)
26	25	36	21	24	37	24	18	19	19	19	16	Local, Small 'Mom & Pop' Retail Outlets (grocery & gas)
15	25	10	9	11	16	40	31	12	32	48	30	Local Small Packer or Producer/Packer
6	10	5	5	6	3	66	68	45	60	54	63	Huge Packer, they pick up
4	6	3	3	6	8	44	29	40	47	33	42	Wholesale only to larger stores, you deliver to warehouse
3	10	10	6	10	13	5	3	15	5	7	6	Breweries/Beer or Mead makers
8	11	8	7	6	10	31	12	15	17	29	8	Internet, direct retail, mail order
17	11	25	18	26	22	19	6	28	33	23	15	Work, direct retail
5	6	8	5	6	8	27	33	17	18	7	8	Local/State Fair, with club

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

REPORTING REGIONS													SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS													Range	Avg.		
55 Gal. Drum, Light	1.51	1.62	1.51	1.59	1.38	1.47	1.56	1.51	1.51	1.35	1.45	1.45	1.35-1.62	1.49	1.52	1.21
55 Gal. Drum, Ambr	1.37	1.35	1.37	1.30	1.28	1.31	1.52	1.50	1.40	1.37	1.32	1.45	1.28-1.52	1.38	1.31	1.07
60# Light (retail)	120.00	124.50	130.00	120.83	120.00	125.00	117.50	115.00	124.22	124.22	129.67	140.00	115.00-140.00	124.25	122.81	117.50
60# Amber (retail)	120.00	115.00	130.00	119.33	120.00	117.50	109.00	120.00	109.25	125.42	139.67	137.00	109.00-139.67	121.85	119.88	111.09
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	52.08	51.95	45.60	43.80	64.44	49.50	49.43	64.44	64.44	42.00	45.00	80.00	42.00-80.00	54.39	57.00	51.35
1# 24/case	65.52	70.37	72.00	56.95	72.00	78.40	69.85	70.47	59.50	94.44	80.20	90.00	56.95-94.44	73.31	77.23	72.99
2# 12/case	69.72	64.08	66.60	58.33	66.00	61.13	58.83	78.00	52.00	69.24	56.13	75.00	52.00-78.00	64.59	60.07	62.65
12.oz. Plas. 24/cs	64.32	63.97	50.40	63.65	57.60	66.00	58.25	54.48	51.00	53.04	56.40	64.50	50.40-66.00	58.63	58.09	57.21
5# 6/case	76.43	75.98	78.00	67.90	74.33	77.50	69.12	78.00	63.50	64.41	73.50	89.00	63.50-89.00	73.97	73.21	70.38
Quarts 12/case	101.14	110.88	101.14	98.50	79.50	90.31	85.47	87.84	102.12	104.52	91.20	101.00	79.50-110.88	96.13	94.87	93.73
Pints 12/case	67.02	56.95	67.02	64.50	58.00	54.33	52.40	52.04	66.00	56.10	50.87	67.75	50.87-67.75	59.42	65.61	54.06
RETAIL SHELF PRICES																
1/2#	2.88	3.22	2.99	2.96	2.29	2.83	3.07	2.51	2.00	2.91	2.99	3.95	2.00-3.95	2.88	3.01	2.76
12 oz. Plastic	3.25	3.82	2.73	3.73	3.49	3.63	3.44	3.64	3.33	3.29	4.13	4.33	2.73-4.33	3.57	3.63	3.44
1# Glass/Plastic	3.83	4.36	4.80	4.49	4.27	4.68	4.42	4.20	3.89	4.47	5.12	4.95	3.83-5.12	4.46	4.59	4.21
2# Glass/Plastic	8.38	7.50	9.07	6.90	6.85	7.15	7.11	8.26	6.37	7.45	8.05	9.15	6.37-9.15	7.69	7.31	7.03
Pint	7.51	7.38	7.51	6.13	5.72	6.19	6.56	5.52	6.50	7.01	7.05	7.90	5.52-7.90	6.75	6.67	6.28
Quart	12.29	9.48	12.29	9.97	7.95	9.78	8.65	9.57	9.50	13.20	10.28	14.00	7.95-14.00	10.58	10.70	10.61
5# Glass/Plastic	16.00	15.24	19.45	15.11	18.93	14.50	17.56	18.06	15.85	14.89	18.60	19.00	14.50-19.45	16.93	15.86	16.39
1# Cream	5.25	5.48	6.30	5.77	6.30	4.25	5.21	5.49	3.29	5.99	6.40	6.15	3.29-6.40	5.49	5.77	5.09
1# Cut Comb	5.50	4.78	7.25	5.25	9.72	4.80	6.09	5.50	9.72	8.00	9.75	8.50	4.78-9.75	7.07	6.31	6.47
Ross Round	6.90	5.75	6.50	5.28	6.90	4.00	5.77	6.50	6.90	6.90	7.67	8.75	4.00-8.75	6.49	6.28	5.81
Wholesale Wax (Lt)	3.00	4.00	4.25	3.74	3.15	4.70	3.72	4.25	3.50	4.18	2.76	4.00	2.76-4.70	3.77	3.90	2.33
Wholesale Wax (Dk)	2.00	3.48	3.25	2.63	2.90	4.25	2.96	3.75	3.01	3.01	2.68	3.01	2.00-4.25	3.08	3.26	2.10
Pollination Fee/Col.	80.00	94.00	75.00	44.00	150.00	49.75	51.17	60.00	87.31	87.31	61.50	115.00	44.00-150.00	79.59	75.75	68.49

Honey Production – 2008

Honey production in 2008 from producers with five or more colonies totaled 161 million pounds, up eight percent from 2007. There were 2.30 million colonies producing honey in 2008, down six percent from 2007. Yield per colony averaged 69.9 pounds, up 15 percent from the 60.7 pounds in 2007. Colonies which produced honey in more than one State were counted in each State where the honey was produced. Therefore, yields per colony may be understated, but total production would not be impacted. Colonies were not included if honey was not harvested. Producer honey stocks were 50.4 million pounds on December 15, 2008, down four percent from a year earlier. Stocks held by producers exclude stocks held under the commodity loan program.

Honey Prices Record High

Honey prices increased to a record high during 2008 to 141.0 cents, up 31 percent from 107.7 cents in 2007. U.S. and State level prices reflect the portions of honey sold through retail, cooperatives, and private channels. Prices for each color class are derived by weighting the quantities sold for each marketing channel. Honey prices for 2008 were up from the previous year for all color classes and marketing channels. Prices for the 2007 crop reflect honey sold in 2007 and 2008. Some 2007 crop honey was sold in 2008, which caused some revisions to the 2007 crop prices.

Survey Procedures: Data for honey producing operations are collected from a stratified sample of all known producers with five or more colonies. States with small populations are not sampled, instead a complete census is surveyed. Individual NASS Field Offices maintain a list of all known honey producers and use known sources of producers to update their lists. All sampled honey producers with five or more colonies are mailed a questionnaire and given adequate time to respond by mail. Those that do not respond by mail are telephoned or enumerated in person. Prices are collected by color class and marketing channel.

Reliability: Since all honey producing operations are not included in the sample, survey estimates are subject to sampling variability. Survey results are also subject to non-sampling errors such as omissions, duplication, and mistakes in reporting, recording, and processing the data. While these errors cannot be measured directly, they are minimized through strict quality controls in the data collection process and a careful review of all reported data for consistency and reasonableness.

We track the top 10 producing states each year because they dominate colony numbers and U.S. production and this year is no different. There are some noticeable changes and differences this year that bear mention. First, since we began tracking these states, there has always been some jockeying to be the list. The top six or seven are usually the same states, though their positions sometimes change. But it's the bottom three or four that fall off or jump on the list. New York, Michigan and Wisconsin have been noted, and for the last four years Idaho has been on the list. This year, for

Honey: Number of Colonies, Yield, Production, Stocks, Price, and Value by State and United States, 2008[1]

State	Honey Producing Colonies[2]	Yield per Colony	Production	Stocks Dec. 15[3]	Average Price per Pound[4]	Value of Production[5]
	x1,000	Pounds	x1,000	Pounds	Cents	1,000 Dollars
AL	9	66	594	214	186	1,105
AZ	25	64	1,600	336	125	2,000
AR	28	75	2,100	525	131	2,751
CA	360	51	18,360	4,039	141	25,888
CO	27	45	1,215	656	150	1,823
FL	150	79	11,850	1,304	130	15,405
GA	55	71	3,905	312	149	5,818
HI	10	90	900	225	148	1,332
ID	90	40	3,600	1,440	142	5,112
IL	8	56	448	116	246	1,102
IN	6	67	402	129	161	647
IA	24	62	1,488	580	156	2,321
KS	10	61	610	128	152	927
KY	4	39	156	27	236	368
LA	29	77	2,233	246	133	2,970
ME	7	42	294	79	150	441
MI	71	73	5,183	2,021	143	7,412
MN	122	78	9,516	2,569	139	13,227
MS	14	98	1,372	110	130	1,784
MO	11	53	583	152	178	1,038
MT	134	70	9,380	4,596	137	12,851
NE	36	67	2,412	1,254	142	3,425
NV	10	29	290	52	237	687
NJ	9	40	360	122	158	569
NM	6	48	288	95	148	426
NY	50	70	3,500	1,260	150	5,250
NC	12	52	624	137	212	1,323
ND	390	90	35,100	8,424	135	47,385
OH	14	53	742	371	188	1,395
OR	50	43	2,150	1,097	148	3,182
PA	23	48	1,104	276	165	1,822
SD	225	95	21,375	11,970	134	28,643
TN	7	61	427	149	204	871
TX	77	64	4,928	1,380	134	6,604
UT	28	48	1,344	242	156	2,097
VT	5	66	330	119	179	591
VA	6	42	252	45	218	549
WA	41	44	1,804	722	150	2,706
WV	6	43	258	49	198	511
WI	58	80	4,640	2,366	140	6,496
WY	39	61	2,379	381	137	3,259
Oth Sts[6][7]	15	51	765	130	229	1,752
U.S.[7][8]	2,301	69.9	160,861	50,445	141.0	226,814

[1]For producers with five or more colonies. Colonies which produced honey in more than one State were counted in each State.
[2]Honey producing colonies are the maximum number of colonies from which honey was taken during the year. It is possible to take honey from colonies which did not survive the entire year.
[3]Stocks held by producers.
[4]Average price per pound based on expanded sales.
[5]Value of production is equal to production multiplied by average price per pound.
[6]CT, DE, MD, MA, NH, OK, RI, and SC not published separately to avoid disclosing data for individual operations.
[7]Due to rounding, total colonies multiplied by total yield may not exactly equal production.

the first time Georgia made the top 10, inching out no 11, Idaho. Interestingly, Idaho had 90,000 colonies in 2008 while Georgia's 55,000 out yielded Idaho's 71 to 40 pounds per colony. What the difference was can be explained by timely rains perhaps, but the factor is that for the previous three years, Georgia's average colony yield has been 52 pounds per colony. This year's extraordinary production figure came out to be over 70 pounds/colony, for their 55,000 colonies.

Texas, while still on the top 10 list, saw a significant drop of 28,000 colonies from their 2007 total. Yield dropped from 82 pounds per colony to 64 pounds, an equal 28% drop, so you combine the two and you see a 43% drop in total honey production from the Lone Star state. This puts the Longhorns in the unenviable position of being number one in downward shift. Colony numbers in Texas have been in the low 80s for several years, and this years drop of nearly a third bears watching.

California saw some changes this year too. Increasing resident colonies by 20,000, or a little over 5%. Twenty grand sounds like a lot of colonies (there are 26 states that have fewer than 20,000 total colonies), to be only 5%, but with a grand total of now 360,000 (16% of the total U.S. colonies) spread out over this very big state, it shrinks in comparison. Further, considering that almond pollination requires about 1.2 million colonies, about 49% or so of all the colonies in the country, California needs to import at least 840 – 850,000 from other states, so that 20,000 shrinks further. Nevertheless, that's still more than half the states have.

When looking at the total production of the top 10 (ranking of top ten states is based on honey production, not colony count), the percent of U.S. honey produced remains right at 75% ... close to the 80:20 rule...20% of the states produce (almost) 80% of the honey. When it comes to colonies, it's the 70:20 rule...20% of the states have 70% of the colonies. This has remained steady for the last eight years, even thought the amount the top 10 produces moves up and down, and even members of this group change most years.

The glut of colonies that showed up in California this spring demonstrated that 1) beekeepers seem to have figured out how to keep their bees healthy so there were more colonies this year to bring to California; 2) that water trumps everything when it comes to growing crops; 3) that pollination contracts aren't perfect, but they are a far sight better than no contract at all; and 4) with the price of honey as high as it is, and the possibility of inexpensive imports flooding the market slim, the number of colonies that come to California will probably be reduced, those that do show up will have good contracts, and be in particularly good shape.

Now, we wait for the AIA colony count, and see what it is that we don't know at the moment. Will the count go up, down, stay the same? Stay tuned.

Honey Prices 1995-2008

Cents/lb.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
All Honey	68.5	87.8	75.7	65.5	60.1	59.7	70.4	132.7	138.7	108.5	90.4	104.2	103.2	141
Retail Shelf	100.0	117.3	125.7	114.7	126.6	130.4	142.2	152.5	188.5	188.7	183.3	191.0	196.1	197.6
%Difference	31%	25%	40%	34%	53%	54%	51%	13%	26%	42%	51%	46%	29%	28%

Top Ten Producing States Each Year

2003			2004			2005			2006			2007			2008			
State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	X1000 Col.	Colony % Change	X1000 Prod lbs
CA	480	32.1	ND	390	30.4	ND	370	33.7	ND	350	25.9	ND	420	31.1	ND	390	-7%	35.1
ND	340	29.6	SD	215	22.6	CA	400	30.0	CA	380	19.8	CA	340	13.6	SD	225	-12%	21.4
FL	210	14.9	FL	205	20.1	SD	220	17.4	FL	170	13.8	SD	255	13.3	CA	360	+6%	18.4
SD	215	14.0	CA	390	17.6	FL	160	13.8	SD	225	10.6	FL	160	11.4	FL	150	-6%	11.9
MN	120	10.0	MT	140	10.8	MN	120	8.9	MT	132	10.4	MT	135	9.2	MN	122	-6%	9.5
MT	145	9.6	MN	135	10.1	MT	130	8.7	MN	125	10.0	MN	130	8.8	MT	134	>1%	9.4
TX	140	9.4	TX	116	8.8	TX	84	6.0	WI	64	6.0	TX	105	8.6	MI	71	>1%	5.2
WI	74	5.7	ID	100	6.3	WI	64	5.3	TX	82	5.7	ID	92	3.8	TX	77	-27%	4.9
NY	67	4.8	WI	68	5.8	MI	65	4.4	ID	95	4.2	MI	72	4.6	WI	58	-3%	4.6
MI	65	4.8	MI	65	4.3	ID	95	3.5	MI	72	4.0	WI	60	5.0	GA	55	-8%	3.9
Total	1856	134.7		1824	136.8		1708	131.7		1695	110.4		1769	109.7		1642	-8%	120.3
All Sts.	**2590**	**181.1**		**2599**	**181.7**		**2410**	**175.0**		**2392**	**154.8**		**2442**	**148.5**		**2301**		**160.9**
% of Tot.	**72%**	**74%**		**71%**	**75%**		**71%**	**75.3%**		**71%**	**71.3**		**72.4%**	**73.8**		**71%**		**75%**

a closer look

STING ALARM PHEROMONE

Clarence Collison
Audrey Sheridan

The immediate but rather short-lived defensive response that alarm pheromone produces classifies it as a "releaser" pheromone.

Insect pheromones are categorized according to the response they elicit from the receiver, which by nature of the term "pheromone" is a member of the same species. Some pheromones are released in a defensive context and signalize potential danger – these are called "alarm pheromones." Receivers of alarm pheromones respond by either dispersing or attacking the perceived source of danger. In honey bees, two principal alarm pheromones have been identified: the sting alarm pheromone (Boch et al. 1962), and the mandibular gland alarm pheromone (Shearer and Boch 1965), both produced exclusively by worker bees. The role of mandibular alarm pheromone (2-heptanone) in defensive behavior is not well understood, but sting alarm pheromone influences the recruitment, localization and attack behaviors demonstrated in a honey bee colony defense effort.

(Z)-11-eicosenol and isopentyl actetate (IPA, or isoamyl acetate), along with trace amounts of about 40 other compounds, comprise the sting alarm pheromone (Hunt 2007). This pheromone is produced by a mass of excretory cells, called Koschevnikov's gland, located on the dorsal side of the sting base, and is secreted when the sting is extruded. Alarm pheromone migrates from the Koschevnikov's gland to setae (hairs) located around the sting base, where it dissipates into the air (Breed et al. 2004). Although (Z)-11-eicosenol is the most abundant component in alarm pheromone, it seems to only serve as a synergist with the more potent isopentyl acetate. This synergistic mixture has been shown to actuate defensive response nearly as effectively as an intact sting (Hunt 2007).

Isopentyl acetate production begins around three to four days of age and peaks at about two to three weeks. It is believed to be mediated by the release of juvenile hormone; however, the onset of IPA production is not related to the shift from nest duty to foraging (Robinson 1985). The amount of IPA released during defensive behavior increases as a worker bee ages, reaching its highest level at about the time when the worker is old enough to perform guarding tasks. The number of guard bees at the hive entrance varies, increasing during times of dearth, when robbing is more likely to occur (Winston 1987). When patrolling guard bees perceive an intruder they raise their abdomens in the air, extruding the sting. Alarm pheromone is released and fanned into the hive by the agitation of wings, and workers come rushing out to pursue the intruder. However, the intruder must be in motion in order for bees to locate and attack it (Breed et al. 2004; Boch and Shearer 1971).

"Honey bee defensive responses are modulated by environmental conditions such as high humidity, heat, and nectar availability."

The immediate but rather short-lived defensive response that alarm pheromone produces classifies it as a "releaser" pheromone. Yet, recent research has indicated that sting alarm pheromone not only provokes a quick defensive response but also influences behavior for a longer period of time by affecting brain gene expression (Alaux and Robinson 2007). This was demonstrated when an initial exposure to IPA affected behavioral responsiveness to subsequent exposures to IPA, inducing the expression of a gene and transcription factor in the antennal lobes. Normally, gene expression is triggered by "primer" pheromones, so it is probable that alarm pheromone has both releaser and primer qualities.

There is an observable quantitative effect of IPA on honey bee sting behavior that appears to be a function of the number of bees present. The relationship of IPA concentration to oxidative metabolism (indicator of pheromone perception) was measured to determine the sensitivity of worker bees to IPA when the number of bees per group was varied. Small groups (< 100 bees) were the most metabolically responsive to IPA exposure, and large groups (>100) failed to show a dose-dependency. A group of 40 bees was the optimum size for IPA responsiveness. In a group of this size the dose-response correlation

was nearly perfect up to a dose of 2.4 ig/mL, after which IPA responses plateaued; doses greater than 2.4 ig/mL did not show an increased response (Southwick and Moritz 1985).

Although isopentyl acetate is the only chemical identified directly with sting-releasing activity, an array of other volatile hydrocarbons appears in extracts of the sting apparatus, some of which have an obvious role in defensive behavior (Wager and Breed 2000; Blum et al. 1978). In a combined laboratory and field assay of 11 alarm pheromone components, two of the compounds, 2-nonanol and octyl acetate, gave orientation information, respectively repelling and attracting bees. Isopentyl acetate was the only compound to affect the recruitment and flight behavior of honey bees, but in large concentrations it repelled bees, including drones (Wager and Breed 2000). The latter observation was surprising, considering drones do not participate in colony defense and thus do not need to respond to alarm pheromone. The chemoreception of drones was further investigated in an electroantennogram (EAG) study, in which the responsiveness of worker antennae and drone antennae to IPA was compared. Although drones lack a sting and do not exhibit any behavioral response to IPA, the EAG outputs for drones were nearly as great as those of workers (Vetter and Visscher 1997). The sensitivity of drone antennae to IPA may be due to the greater overall chemosensory potential of drones compared to worker bees.

Honey bee defensive responses are modulated by environmental conditions such as high humidity, heat, and nectar availability (Breed et al. 2004). However, a large portion of the defensive phenotype can be attributed to heritable factors. There is a very strong correlation between lifespan and heightened response to IPA, which merits attention when breeding bees for longevity and vigor (Rinderer et al. 1983). Genetic influences on defensive behavior are also evident from frequent observations that certain lines and races of bees are more "aggressive" than others. The basis for aggression may be due to differences in the chemical composition of alarm pheromone. For example, at least nine of the components of sting alarm pheromone are produced in greater amounts in

"In relation to the small hive beetle (SHB), Aethina tumida, the honey bee's alarm pheromones serve a negative function because they are potent attractants for the beetle."

Africanized bees (*Apis mellifera scutellata*) than in the European honey bee (*A. m. ligustica*) (Hunt et al. 1999). Or, these defensive differences may be attributed to an increased sensitivity of neuroreceptors to alarm pheromones in certain genetic stocks.

Smoke has been used to suppress honey bee defensive behavior in managed hives for thousands of years. Until recently, it has been a mystery as to why smoke interrupts the succession of behaviors following alarm pheromone release. An explanation was offered by the results of an electroantennogram study, which compared the antennal responses of worker bees to isopentyl acetate and 2-heptanone before and after the addition of smoke. In both assays, the addition of smoke significantly decreased antennal responses. This effect was reversible, and the responsiveness of antennae gradually returned to normal within 10-20 minutes of removing the smoke. A similar effect occurred with a floral odor, phenylacetaldehyde, suggesting that smoke interferes with olfaction generally, rather than specifically with honey bee alarm pheromones. A reduction in peripheral sensitivity appears to be one component of the mechanism by which smoke reduces nest defense behavior of honey bees (Visscher et al. 1995).

Alarm pheromones are critically important to the survival of honey bee colonies. However, in relation to the small hive beetle (SHB), *Aethina tumida*, the honey bee's alarm pheromones serve a negative function because they are potent attractants for the beetle (Torto et al. 2007). In addition, the beetles vector a strain of yeast, *Kodamaea ohmeri*, which produces an alarm pheromone mimic when it feeds on stored pollen. The environment of the European honey bee colony provides optimal conditions to promote the unique bee-beetle-yeast-pollen multitrophic interaction that facilitates SHB infestation of hives at the expense of the honey bee. The small hive beetle detects IPA at an even lower threshold than detected by the honey bee, so it is advisable to minimize agitating hives by frequently opening or disturbing them. BC

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Collecting Water

How honey bee colonies control water collection

Tom Seeley

Colonies of honey bees, like all living systems, need water to survive. Water is needed not only to prevent dehydration of the adult bees, but also to prepare liquid food for the brood and to cool the hive on hot days. Often a colony's water need is met by the water that its foragers retrieve incidentally as they collect nectar, since nectar contains much water. Sometimes, however, a portion of a colony's foragers must intentionally collect water from streams, ponds, and other wet places. These are times when either the colony's nectar collection is very low, due to a dearth of nectar-bearing flowers, or its water consumption is very high, due to high ambient temperatures that necessitate intensive evaporative cooling inside the hive. A colony's need for water collection is, therefore, highly variable, and so it is not surprising that a honey bee colony possesses elegant mechanisms for controlling the rate at which its bees collect water.

Water is collected neither by the young nurse bees who prepare the brood food nor by the middle-age bees who distribute water within the hive for evaporative cooling, but by the elderly forager bees, which fly out to whatever puddle or other water supply is near the hive, fill their honey stomachs with water, and return home. Thus there exists a division of labor between the bees that work inside the hive consuming water and the bees that work outside collecting water. This division of labor implies that a colony must solve the problem of keeping a collection process and a consumption process in balance. Indeed, a prolonged imbalance between water collection and consumption can be disastrous. If consumption exceeds collection on a very hot day, a colony can overheat, causing abnormal development of the brood if not a complete meltdown of the combs.

Fig. 1 shows how a colony can adaptively adjust its rate of water collection. Martin Lindauer, a German bee researcher, installed a colony living in an observation hive in a greenhouse, where the colony's rate of water collection from an artificial water source was easily monitored. When Lindauer turned on an infrared lamp beside one of the hive's glass walls, threatening the colony with lethal overheating, the colony boosted its water intake to begin evaporative cooling inside the hive. This stabilized the hive's interior temperature. When the heat stress was removed, the colony promptly lowered its water intake.

Clearly, a colony can turn up and turn down its water intake as needed. To understand how it does this, we must address two puzzles: 1) How do a colony's foragers know when to begin collecting water? and 2) How do a

colony's foragers that have begun collecting water know whether to continue or stop collecting water?

Let us first consider what stimulates bees to begin collecting water. Some foragers, perhaps most, are stimulated to start fetching water by the waggle dances of hive mates that have already begun to collect water. But what stimulates the very first water collectors and hence starts the entire water-collection process? In the case of water collection for cooling purposes, one might suppose that it is the sensation of high temperatures inside the hive that initially tells foragers that their colony needs water. But this is not so. You can trigger water collection in a colony occupying an observation hive even if you heat only a small area of the broodnest, where none of the foragers are located. Also, we know that a colony's foragers become strongly motivated to gather water when confined inside their hive by cold or rainy weather. The most vivacious waggle dances that I have ever seen were performed on a winter day when a bright sun raised the outdoor air temperature enough for the bees inhabiting the observation hive in my office to go outside and collect water from puddles of melted snow in the parking lot. Obviously, these foragers must have responded to some cue other than high temperatures inside the hive. What might it have been?

Evidently, what stimulates the first water collectors to action is the presence of highly concentrated sugar solution in their honey stomachs. A bee might sense this either directly, as the fluid passes over her taste organs during food exchanges, or (more likely) indirectly, as a feeling of thirstiness. Many years ago, a student of Martin Lindauer, Hans Kiechle, found a correlation between a high sugar concentration in the honey stomachs of bees near the hive entrance (presumably foragers) and their motivation to collect water. He assayed their motivation by placing a water-soaked cloth at the hive entrance and recording what fraction of the bees that contacted the cloth also drank from it. On rainy days when the bees could not forage, most had an elevated sugar concentration in their honey stomachs and most drank from the wet cloth. He also found that if he fed these bees a dilute (15%) sugar solution, he would lower both their sugar concentration and their desire to collect water.

Once a bee has begun collecting water, she must stay informed about her colony's need for more water and respond

A colony can increase the number of water receivers without strongly decreasing the number of nectar receivers.

accordingly. If the need persists, she should continue collecting and perhaps even perform waggle dances to recruit others to the task. But if the need subsides, she should cease collecting. What tells a water collector to continue or stop her activity?

We now know that a water collector acquires information about her colony's need for additional water each time she returns to the hive and that she does so by noting how easily she can unload her water to bees inside the hive. If there is an acute shortage of water, a water collector's load will be taken quickly and eagerly, and she will continue fetching water. But if the colony's water needs have been met, a water collector's load will be taken slowly and reluctantly, and she will cease collecting. How exactly does a water collector sense the ease of unloading? Several years ago, I studied this question with Susanne Kühnholz, a student from the University of Würzburg in Germany. We took a colony of bees living in an observation hive to the Cranberry Lake Biological Station in northern New York State. There we labeled bees that we found collecting water on the shore of the lake, varied the colony's need for water by heating its hive with

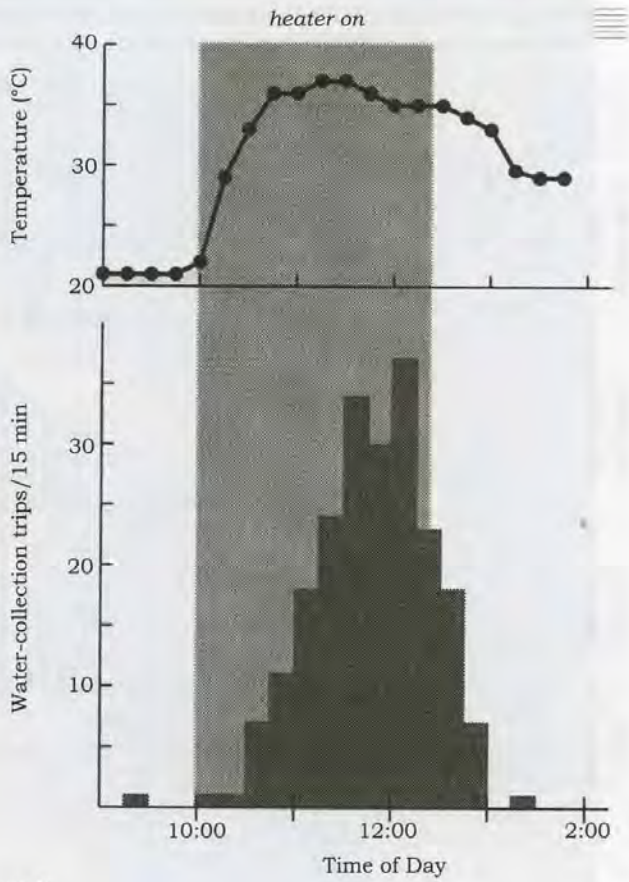

Figure 1

There exists a division of labor between the bees that work inside the hive consuming water and the bees that work outside collecting water. This implies that a colony must solve the problem of keeping a collection process and a consumption process in balance.

a lamp, and painstakingly monitored individual water collectors one at a time, each one for an entire day. We wanted to see in detail how a water collector's unloading experience inside the hive changed when her colony's water need went from high (heating lamp on) to low (heating lamp off). Fig. 2 shows the results for one typical bee. As long as the hive was heated (lamp on at 11:20) and the colony's broodnest was threatened with overheating, each time the bee returned to the hive she needed just a few seconds to find a bee who accepted her load. Also, she contacted only a few bees who refused to take the water, and she needed at most 1 minute from the time when she entered the hive to when she finished her delivery. But once the danger of overheating passed (light off at 2:38), the bee's search times, unloading rejections, and delivery times all increased. In the end, she needed nearly four minutes until she found a bee who accepted her water, she was rejected by hive bees more than 40 times, and hadn't gotten rid of her load after more than 10 minutes. After that, she stopped collecting water.One might wonder if water collectors pay attention to the whole constellation of variables of the unloading experience, some subset of these variables, or perhaps just one special variable. To begin to see which variable(s) might contribute most strongly to the perception of unloading ease, we calculated how much each variable increased when we turned the heating lamp off. Averaging our results for eight bees, we found that the mean search time increased by a factor of six, the mean delivery time by a factor of four, and the number of unloading rejections by a factor of 10. This suggests that the number of unloading rejections may be the most salient variable of unloading ease, and thus may be the primary indicator of whether to continue or stop collecting water.

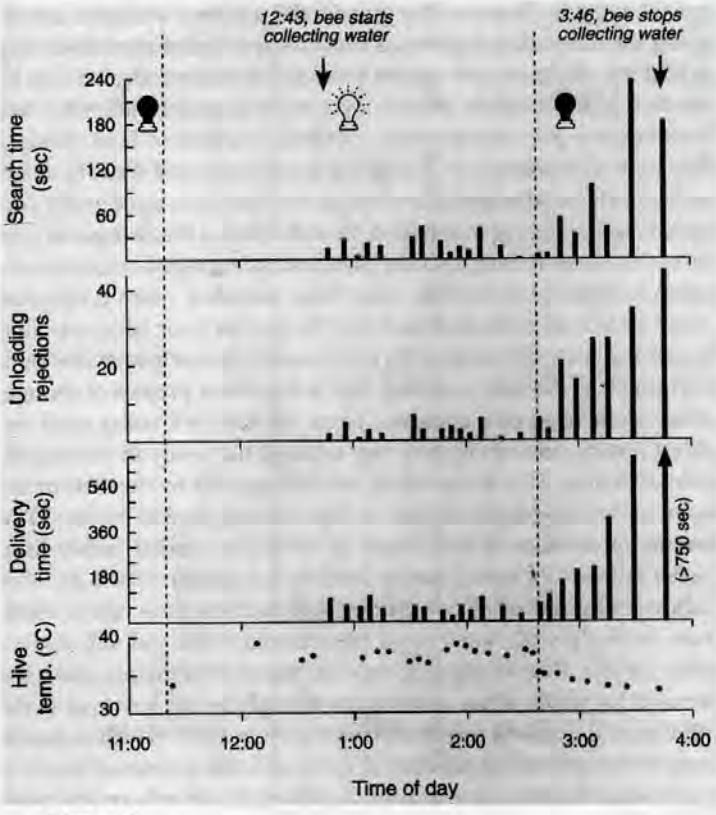

Figure 2

Why does a water collector's ease of unloading change when her colony's need for water changes? The reason that water collectors get unloaded more easily when their colony's water need rises is that there is an increase in the proportion of bees in the unloading area (just inside the hive entrance) that accept water. The rise in this proportion lowers the number of bees that a water collector must contact before finding one that accepts water. We have learned some things about the process whereby the proportion of water receivers within a colony changes when its water need changes. First, we looked at the age distribution of the water receivers at times of low or high need for water (heating lamp off or on), and we found that it does not differ between the two conditions. The water receivers are consistently the middle-aged bees, that is, the bees that are no longer nurse bees but not yet forager bees. Thus, when a colony starts to overheat, it is the middle-age bees that increasingly seek loads of water from water collectors and then walk about the hive, distributing it to other bees or smearing it over the ceilings and sides of cells.

We also checked whether the additional water receivers that appeared when we increased a colony's water need were bees that were functioning as nectar receivers earlier in the day. We found that most were not. This means that a colony can increase the number of water receivers without strongly decreasing the number of nectar receivers. This also explains why, when we stimulated a colony's collection of water (by heating its hive), we never found that this depressed a colony's collection of nectar. This seems highly adaptive, since a colony will be more successful in foraging if its nectar collection is not lowered every time its water collection must be boosted.

The story of the control of water collection in honey bee colonies illustrates how, through patiently performed studies, we can understand our beloved honey bees both at the level of a whole colony functioning as a unit and at the level of individual bees cooperating closely to build a smoothly running society. BC

Tom Seeley is a professor at Cornell University and a featured speaker at the 2009 EAS Conference in Ellicottville, NY in August. For information **www.easternapiculture.org**.

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'Bout a 100 – Sideline Beekeeping

LAWS, RULES AND REGULATIONS AND THE BEEKEEPER

Larry Connor

Rants About Silly Rules

It is fair to say that most beekeepers want to be left alone. *Just let me keep my bees, sell my honey and pollinate my garden.* People associated with the bee industry a lot longer than I've been tell me that beekeepers, as people who want to work alone with a potentially stinging insect, are not the most socially skillful people on the planet. They are sometimes described by their own as being less than progressive leaders in the modern world. Consider this quote, in which a large commercial beekeeper describes his fellow beekeepers as *"knuckle dragging Neanderthals"* who *"don't play well together and with society in general."*[1]

The truth is I have said nearly the same thing working with beekeepers over the past 40 years, especially commercial beekeepers. My academic experience is discounted and my time working as a commercial bee breeder is dismissed. They keep to themselves, and their small cliques at national meetings. *"Don't talk to that guy; it may rub off."*

I think that the smaller the bee operation, the more socialized the beekeeper seems to be. Hobby beekeepers can be annoyingly social sometimes, especially when you are trying to close the meeting hall after a long meeting.

None of them – commercial or hobby – take hints very well. Maybe that is why I like working with sideline, semi-professional beekeepers. They tend to be small business operators and share some of the same issues all small businesses experience. Some even understand my sarcasm.

Perhaps, since CCD, we are getting a new crop of more enlightened beekeepers, those who use the Internet daily, and are willing to reach out to non-beekeepers and educate them about their bees. Yet I have been flamed pretty severely on several beekeeping Internet groups (which is why I stopped reading their stuff several years ago). Apparently anyone with one year of beekeeping experience can be an expert on line if their colony didn't die. Maybe this new generation of hive managers are different. I don't know – I'll hold my opinion on that for a few more days, at least.

It is easy to see *why* some beekeepers might want, or need, to operate above the law. Some will deny it if pressed, while others will admit it in front of an audience, asking *"What option do I have?"* Many do not want to be regulated by anyone. We all suffer from the loss of registrations of useful chemicals and languish as we wait for new products to be approved by an ineffective and convoluted Federal government. The research may be done, the product shown to be safe and effective, and yet Federal Agencies do nothing. A few years ago the EPA demanded that Fumidil B, a safe and effective Nosema control, have its basic research repeated to make sure it still worked. The cost: About 1.5 million dollars, which the product owners could not afford. As a result our US supply of fumigillin comes from Canada. Is our Federal government helping us? Or interfering with our work?

Conversly, as an industry we have a long list of charges against *us*. Are we involved in –

Illegal chemical use?

Illegal practices by keeping bees in certain areas where zoning prohibits it?

The use of illegal honey processing facilities that do not meet Home Land Security, State and Local Laws?

Non payment of local, state and federal taxes?

Illegal bee and wasp removal?

Crimes against Nature?

"Don't take a picture of that!"

I have heard that quite a bit lately when I visit another beekeeper, and the host beekeeper opens a hive and there is an unregistered (= illegal) miticide treatment in place. The treatment is either using an illegal material or an unregistered delivery system. Quite often I don't know what they are using. I see chewed-on shop towels, meat pads and corrugated plastic signboard in the hive, on the ground of the apiary (at least pick up the evidence for heaven's sake!) or in containers filled with special equipment used for treatment.

What is even more disturbing is the number of times I see hives that have MULTIPLE treatments at the same time. Poor bees. . .

If a compound is not registered for use in a beehive it is illegal. Even Ivory soap, used in a water spray to kill bees – like unwanted African bee swarms – is illegal because the soap is being used as an insecticide. Ivory Soap is not a registered insecticide as far as I know. That will not stop most beekeepers. So, while there is an effective method to kill bees that is completely safe to use, as a professional I am unable to recommend its use.

Therein is the conflict, since I am not a lawyer or a professor of ethics. But it seems to me that a lot of the regulations in this country just do not make any sense at all. For example, the Ivory soap issue. If I was called to a neighbor's house and bees were stinging everything in sight, I would consider killing the bees. For me the Ivory soap is the quickest, easiest and safest way I know to kill a hive of nasty bees. Even here in Michigan

[1]John Miller, quoted in "The Silence of the Bees", March 19, 2008, High Country News, Paonia, CO.

"Just let me keep my bees, sell my honey and pollinate my garden."

we have *reports* of African bees from packages, from queens, from migratory beekeepers – I am not sure which. But the reported bees are usually not tested, so it is hearsay. But the stinging attacks are real and must be managed by beekeepers. Please don't call the National Guard. If it is in a public area call the local fire department. If is a private homeowner, call an experienced beekeeper who knows how to make the problem become a non-problem.

More involved pesticides and mite treatments create a much greater exposure that may come back to bite us on the butt with hard data. With the growing research effort stimulated by CCD, there are now more and more people looking for pesticide residues in the hive in the honeycomb, honey, pollen and propolis. There is now a better chance that your illegal use of a compound will be detected in a chemical test from your own colonies.

"Gosh, I never treated with that!"

"I can't sell my honey at the village festival!"

A neighbor beekeeper who does not have a food approved honey processing facility for her two hives may sell her honey at the door, but she cannot go to her village festival and sell it. Legally that is. That is just stupid. It means that I cannot buy honey from a neighbor when I see her at her garden produce table, but I can go to the golden arches and ask for honey for my mystery chicken bits, honey that comes in tiny containers with no country of origin or even a hint of the source. I don't get it. I know my neighbor and she has no reputation of poisoning anything. I don't have a clue where the arches got their honey tubs. And, after poison in milk, toothpaste, peanuts, chili peppers and other scares, I am less and less secure about buying food from big companies, especially if they import food products! This is driving a lot of folks to Eat Local. But you will not be able to buy the honey from my neighbor when you buy your fresh green beans and sweet corn! *Insane!*

"How much if I pay you in cash?"

Oh, the great underground economy of this country! As economic conditions tighten, more and more people are looking for cash deals. Does this mean that they will not report this income to the state sales tax office or the IRS? Frankly, I don't know if they do or do not.

But I know which way I would put my bet, IF I were a betting man.

I am sure that there are small-scale beekeepers who never report any income from their bees. They probably do not expense the bee equipment they buy either. But most beekeepers are pretty darn careful with their expenses and look for a way to run their operations as a business.

Now, accountants have told me that if you enjoy your bees as a beekeeper, you have a hobby and cannot deduct your expenses. But if you hate the bee work you do you run a business. Well, what do bean counters know about beekeeping (unless they keep bees)? As far as I can tell, the difference between a hobby and a small business is how you approach your entire business operation. If you expect to make a profit (even if you did not), and you are actively involved in keeping bees, you have a business. If you want to make money with bees, and you are attending meetings to improve your methods, and you carry out your beekeeping in a business-like manner, you are a business in my opinion, especially if you have a number of hives. If you buy just one hive and sell a few pounds to neighbors, you have a hobby operation.

The advantage to having a small business is simple: you can deduct expenses you have in running that business, including equipment, bees, feed, medications, miticides and travel to bee meetings. Some sideliner beekeepers never take any money from the business, but use it pay for their travel to beekeeping meetings, since they are going there to become better beekeepers. If they happen to meet friends and enjoy the meeting, it does not mean they cannot claim the expenses on their farm or business form on their taxes.

"Will you please get rid of these yellow jacket bees?"

Okay, yellow jackets are wasps. If you remove a swarm of bees from a tree branch, and you do not charge for this, you are a beekeeper. If you remove a nest of yellow jacket wasps from the foundation of somebody's house, you are a pest control operator. If you charge for either you probably need a PCO license and all the training and exams and fees that go with that. I know some states have an easy route to bee removal – essential in areas with African bees – but not all do. Being a good neighbor may be illegal if you open a can of insecticide into a wasp nest for the elderly couple across the street.

Of course, these laws initially came from some idiot's abuse and maybe the envy of green-eyed PCOs; even those that would never kill a hive of bees do not want beekeepers removing a wasp nest. Ouch! You just stung me in my wallet!!

Crimes against Nature

Ever kill a bee putting the lid back on a hive? Of course you have, no matter how carefully you work. So, you are a bee killer. The sky will fall if you kill that hive of bees with Ivory Soap, right on your head. You are an evil bee killer. And a honey robber. And a bee abuser, putting bees on a truck for pollination.

Why can't you just let the bees go wild, and let them live in nature, and not mess with them? I can live without honey for my organically grown green tea. Those bees will do so much better if you do not feed them when they are starving, or medicate them when their parasite loads gets high. Right? We can put hollow logs in the parks to let the bees occupy, and we will not

"Accountants have told me that if you enjoy your bees as a beekeeper, you have a hobby and cannot deduct your expenses. But if you hate the bee work you do you have a business."

need you to keep your bees in those prisons you call bee hives. You must do that! Or we will raid your apiary and open all the hives and let the bees fly free from your enslavement and exploitation!

And if all the bees die from mites or systemic insecticides or new viruses and bacteria, I know that I can learn to live without my favorite fruits and vegetables and cooking oils. I can substitute my organic cotton T-shirts with shirts hand woven with wool from free range sheep that have voluntarily offered up their heavy coats to only the most honest and humble of shepherdess. I am sure it will all work out. Let your bees go! I will feel so much better.

When not sharpening his tongue with acrid venom, Dr. Connor is really a pretty nice guy who do[BC]talk to beekeepers. Recently he was named the "Queen Bee" of the new Kalamazoo Bee Club, but is not sure how or why that happened. You can read some of his less venomous materials at his website **www.wicwas.com**. *The last year's worth of* Bee Culture *articles are there as PDF files. Thanks to Kathy Summers for making that happen! You can comment on this article, or contact Dr. Connor at* **larry@beeculture.com**. *Dr. Connor and Lesli Huston are the instructors at the Special Microscopy Workshop at EAS this Summer. See more at www.easternapiculture.org.*

EAS Holiday Valley

All The Buzzzz in...

Send us a photo of you in your garden.

Hello Friends,

Spring is right around the corner. Plan now to include some nectar producing plants in your garden.

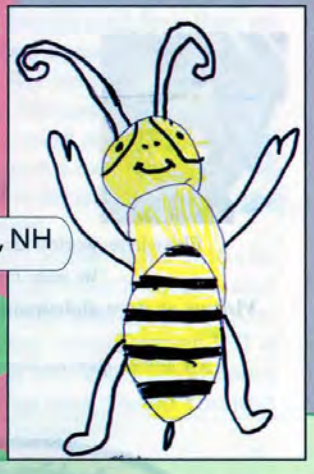
Bee B. Queen

I like bees.
I like cheese.
I like bees.
I like leaves.

Cecilia Spann, 7 WI

Bethany Isaac, 10, NS, Canada

Hugh Spann, 5, WI



Cameo, NH

Ricky Vernon, 4, KS

Nectar, Nectar, Everywhere - Especially in Your Garden

Bees need nectar from plants. The nectar provides food (honey) which bees need to produce wax from a wax gland on the underside of their abdomen. They take the nectar back to their hive, pass it around to each other, put it in the cells, flap their wings and evaporate the water until the nectar becomes honey.

Some plants are better nectar sources for bees than others. When you grow things like cucumbers and melons you are giving the bees a good source of nectar and you get to pick delicious foods to make pickles and pumpkin pie. What a deal!

If you are lucky enough to grow raspberries, you can make jelly and feed the bees. You might not think you are so lucky to have fresh grown asparagus but the bees are so happy you grow it because it also provides nectar to them.

Flowers, like marigolds and sunflowers, are beautiful and useful. They provide nectar to bees and we can make tea from marigold flowers, eat sunflower seeds and share the seeds with our fine feathered friends

Soybeans, alfalfa and clover are very important nectar plants for the bees. These plants are also very important sources of food for us and food for cows and other animals.

When you are planting your gardens, you are also providing dinner for the bees.

May your garden be alive with buzzing bees!

Wikipedia has a number of very good articles about plants and bees. To learn more about nectar sources go to:
http://en.wikipedia.org/wiki/Northern_nectar_sources_for_honey_bees

Bee Kid's Corner

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

Adrianna Noyes, 6, NH

Sydney Richardson, 9, SC

Herbs For Bees

Bees love the flowers of many herbs. Plant them for the bees and for yourself. They all have many uses. They are beautiful and they smell so good! The answers are somewhere in this magazine.

Basil

Oregano

Mint

BASIL
BONESET
BORAGE
CHIVES
HOREHOUND
LAVENDER
MINTS
OREGANO
ROSEMARY
SAGE
THYME

U	M	P	J	U	S	T	S	X	Z	A	M	A	K	K
M	T	N	P	M	T	E	D	E	O	Q	Q	F	K	W
F	A	P	J	P	N	B	A	L	M	L	S	E	A	Y
C	U	G	H	E	I	K	B	A	K	A	K	O	K	D
X	U	Y	J	W	M	A	R	O	U	B	G	H	V	Q
N	N	G	D	V	E	E	Y	L	N	E	V	V	I	M
J	L	V	Z	C	D	U	P	D	O	E	C	A	L	W
B	S	W	J	N	L	C	O	N	S	C	S	Z	K	Z
R	O	S	E	M	A	R	Y	U	O	A	T	E	N	T
H	X	V	Z	E	B	X	M	O	R	L	G	T	T	Q
P	A	R	M	O	V	R	W	H	E	X	I	E	D	W
L	Y	Y	R	X	N	R	B	E	G	J	C	S	L	R
E	H	A	E	Y	X	D	K	R	A	G	K	W	A	Y
T	G	S	E	V	I	H	C	O	N	N	Z	Y	F	B
E	M	F	H	N	V	N	S	H	O	K	Z	C	A	Q

Rosemary Love

Make a lovely rosemary gift for your mother for Mother's Day. It is a gift of love - the bees love the rosemary, you love your mother, you love bees, your mother loves you. What a wonderful circle of love.

Here's how you do it. Go out and cut some rosemary. If you don't have any growing in your garden try calling a garden club or ask your friends and neighbors if they have some you could use. If no rosemary can be found, try using other plants and flowers.

Bunch up the rosemary and put a rubber band around the stems. Tie a bright ribbon around the rubber band. Make a chenille bee, wrap a thin wire around it and add it to the bunch. Make a card and surprise your mom.

Zachary Wallace, from Florida, made a pine derby car called "The Buzzer". It has a honey bee theme. He is sitting in front of a two frame extractor.

Beecome a Bee Buddy

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

Name: _____

Address: _____

City, State, Zip Code _____

Age: _____ Birthday: _____

E-mail (optional) _____

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

Spring Reversal

Make sure there are enough bees, but not too many bees before you do this.

Ross Conrad

Reverse your bees to help them start the season off on the right foot...

For many, reversing hives represents the beginning of the busy working season with regard to the beekeeping year. It marks the passage of another year with the bees, and the promise of a new year ahead. Of all the chores that need tending to in the bee yard on a nice warm day in spring, reversing also tends to be one of the most important.

When possible, honey bees prefer to store the majority of their excess honey above the brood nest. The act of reversing the order of the hive bodies that make up a hive, ensures that the majority of the bees, brood, honey and pollen within the colony are all located as close to the bottom of the hive as possible in early Spring and the equipment that contains unused space is positioned above for the colony to expand the brood nest and to store and ripen nectar during the rest of the season.

It has long been recognized that reversing provides more room for honey storage, and has a tendency to break up the brood nest (if it spans more than one hive body). This extra room in the hive often helps to keep a colony from feeling crowded and thus reduces that aspect of the swarming tendacy. By **delaying** the act of swarming in this way the beekeeper helps to ensure that the hive will have the workforce necessary to fill up the hive with enough honey to last through the dearth of winter. Should the colony be allowed to swarm too early in the season, and that year just happens to be a year in which the blossoms do not yield much in the way of nectar, you are more likely to spend a lot of time and money feeding your bees or else have them die of starvation.

Notice that I used the word "delaying" rather than "stopping" or "eliminating" with regard to the goal of influencing the swarming instinct. A queen bee laying an average of about 1,200 eggs a day is not engaged in the act of reproduction. The queen is simply maintaining the body of the colony. Just as everyday, the human body experiences the death of thousands of cells and at the same time, creates thousands of new cells, the beehive loses many bees and creates numerous new bees daily. True reproduction occurs when the single organism (or superorganism in this case) divides into two, through the act of swarming. From an holistic perspective, efforts to regularly suppress swarming through hive management, or by breeding the swarming instinct out of bees are misguided because they do not consider the primary needs of the honey bee as paramount.

Whenever I am reversing my hives, I like to take advantage of the opportunity it presents to take care of some housekeeping duties at the same time, such as inspecting each colony. By evaluating the activity in front of the hive before it is opened, noting the bee population within, the amount and condition of the brood, the amount of pollen and honey stored away, and the type and level of debris on the bottom of the hive, the health and vitality of the hive can be quickly and easily determined. Once the strength and condition of the colony is known, it is typically an easy matter to identify issues that may arise during the rest of the season with no more than a cursory peek under the inner cover.

When the colony's hive bodies are separated it is a great time to scrape the top and bottom bars of the frames clean of any burr comb that may have been built upon them. This clean up work will help prevent bees from getting squashed when you re-stack the hive bodies. My tendency is to stand each hive body on end and

An old hive body with a screen stapled over the bottom makes a handy collection box for wax and propolis scrapings.

Swarming scenes like this are as joyous as the birth of a new child from the honey bee's perspective.

without removing the frames, scrape the burr comb into a box in order to collect the scrapings as both wax and propolis. While most of the attention in beekeeping is paid to honey production, bees wax and propolis both fetch a higher price per pound in the marketplace. An important consideration in these challenging economic times. In deference to the bees, I blow some smoke across the frame tops and bottoms in order to make them easier to scrape. To move things along faster, I like to clean off the top bars first and save the scraping of the bottom bars for last. This way most of the bees will already be cleared off the bottom bars when the hive body is ready to be put back in place and few, if any are likely to get caught between the edges of the hive bodies as they are stacked one on top of the other.

During the inspection process, should I find that a colony is on the weak side and only occupies a single hive body, I will check to see how much unused space is available within the box. When significant amounts of comb are not being used for brood rearing or food storage, I like to remove all other boxes completely from the colony thereby adjusting the room available within the hive to better match the needs of the bees and the ability of the small colony to maintain their nest.

Once such unused equipment is removed from the hive and before it is put back into use on the same or another hive, I find that taking the time to remove all the frames and scrape their surfaces clean along with scraping the insides of the hive body goes a long way to making future hive manipulations easier on the bees and myself once the equipment is put back into use. While cleaning up unoccupied hive equipment tends to be a dirty job and not very glamorous, I find it's well worth the effort to prevent the buildup of propolis and burr comb that can accumulate over the years and turn the frames inside the box into a single solid, and hard to separate mass. Cleaning vacated equipment is the ideal time to rotate out two to three frames and replace them with frames with new foundation for those who are incorporating regular frame rotations into their yearly management practices in the effort to reduce the potential buildup of chemical contaminants and diseases within the hive.

A question beginning beekeepers often ask is "when is the best time to reverse my bees?" The answer to this question depends on your location. I have always found the best time to be on a warm sunny day (60°F or better) that occurs at the beginning of the first major honey flow in the area. In Vermont this is typically sometime in the beginning of May.

Reverse the hives too early and there may not be enough bees to fully cover and keep the brood nest (that is now broken up) warm, resulting in a lot of brood being lost due to cold temperatures. I can often get away with reversing on the last days of April if I am in a crunch to get the bees ready for pollination in early May, but I run the risk of weakening the hives from chilled brood when doing this. Paying close attention to the long range weather forecasts and crossing the fingers helps when trying to push up the season in this way.

By the same token if I wait too long before getting around to reversing hives (mid-late May), I am likely to find swarming preparations well under way by the time I arrive. Should this happen to you and you find yourself confronted with a dozen or so queen cells upon inspecting the hive, my suggestion would be to make yourself a nucleus colonies and hive those bees before they fly away.

As someone who is committed to keeping bees as naturally and organically as possible, I have always preferred to align my management techniques with the natural cycles and instincts of the bees. I have always tended to shy away from invasive swarm control efforts such as clipping the wings of queens and destroying queen cells when I find them. Such efforts seem based on the same kind of thinking that has created our petrochemical based industrial agriculture system, which despite its promise, is failing us on too many fronts for my comfort. It is precisely these failures that is causing a growing number of beekeepers to turn to more natural management practices. BC

Ross Conrad, author of Natural Beekeeping, *regularly conducts organic beekeeping workshops, classes and consultations in between taking care of his own bees. Dancing Bee Gardens, P.O. Box 443, Middlebury, VT 05753; www.dancingbeegardens.com; dancingbeegardens@hotmail.com. He is a featured speaker at EAS this Summer.*

Non Chemical Varroa Control

Steve McDaniel

Drone-brood removal has long been used as a *Varroa* control method, with greater or lesser success. A new variation of the old technique makes it particularly quick, easy, and effective. Long considered a labor-intensive practice suitable only for hobbyists, this modification makes the procedure ideal for the commercial beekeeper as well. Even the birds in your yard can help you control the mites in your hives.

It is well-known that *Varroa* mites are attracted to drone brood, because the longer development time after capping (15 days, as opposed to 12 days for workers) gives the mated female mite that invades the cell just before capping more time to raise little mites. She may be able to make one or occasionally two female offspring in a worker cell, whereas in a drone cell, she can reliably produce two or three offspring. That doesn't sound like much of a difference, but over a typical season in which the mites can go through 12 generations or more, the resulting population difference is huge. Researchers peg the rate of preference for drone brood at eight to 10 times the rate for worker brood. In other words, given a choice, the mite is far more likely to go into a drone cell than a worker cell.

How to best take advantage of this preference is the trick to controlling the *Varroa* population. Removing drone brood during the Summer can have some effect but must be done repeatedly, a few weeks apart, to make any real dent in the population. The bees invest a lot of resources into making drones, so frequent removal places a drain on the colony. Repeated removal also places a selection pressure on the mites, which may in time lead to the evolution of mites with no preference for drones, as only the ones in the worker cells remain to reproduce.

My method involves removing brood only once a year, so there is little drain on the colony or selection pressure on the mites. The time required to implement the technique is only about one minute per colony, so even the most harried commercial operator can do it on a single trip to the apiary.

•

In a nutshell, here – my technique: I find the first substantial patch of drone brood to be capped in the Spring and remove it, comb and all. I put the comb at my backyard bird feeder, and the birds clean it out in about a day. Then the comb can be reused, if it is in a frame, or melted down if it isn't. That's all there is to it!

•

After a Winter of nothing but worker brood to infest, *Varroa* mites are hungry for drones. When the first batch of drones is about to be capped, nearly every mite in the colony descends on it, sometimes two or three mites per drone. Removing the brood before any drones emerge takes practically every mite right out of the colony! I feel that the treatment is every bit as effective as a miticide, but with no chemical residue to worry about. It works faster, too. In seven years without using any chemical mite treatment, this is the only *Varroa* control method I have needed, and my bees are thriving, with Winter losses under 10%. Mid-Summer sugar-roll tests usually yield about one to three mites per test, which is well below the treatment threshold of 10 mites per 300 workers.

The timing for this technique is critical, but there is some leeway. The drones will be capped for fifteen days, but the beekeeper has to be looking inside the hives regularly to know when this stage in brood development has been reached. Removal is effective at any time in this two-week period, but the exact timing will depend on the location of the hive, its strength, and the weather. Not all colonies in an apiary will reach this stage at the same time, but often all colonies in an apiary can be treated on the same day.

One key to making this job go quickly is to have all the drone brood in one place. The method I use is to put one or two medium or shallow frames in each upper deep hive body in a two-deep system, or a one-deep and one-medium system with the medium on the bottom. The small frame goes in the third position from the side of the box (though other posi-

Drone brood with no Varroa.

Shallow frame with drone brood below.

tions work, too), allowing a three-inch space between the bottom of the medium frame and the top bar of the frame below, or four inches if you use a shallow frame. Almost invariably, the bees will fill this space with drone-sized comb. One slice with a hive tool can take out the whole piece in seconds. After you remove it, the bees will rebuild it in a few days.

The idea for using one short comb is brilliant, but I cannot take credit for originating it. Someone in the audience at a presentation I was giving to a beekeepers group suggested it, and I do not know who it was. He may have gotten the idea from someone else, but in any case, thanks to the person who came up with it in the first place. That is how our management process improves from year to year, by sharing ideas and the results of trying new techniques.

Other ways for consolidating drone comb include using drone foundation or one-piece plastic drone frames (the green ones). If the combs in the box are already drawn, just replacing a frame with an empty wooden frame without foundation will usually result in a large part of the frame being built out as drone comb.

In these cases, you may want to reuse the frame, so getting the birds to clean them out for you is very helpful. You do not need to freeze the frame first, but you can freeze the excess if you get so much drone comb that the birds can't clean it out for you in a day or two. The birds don't seem to mind if the brood is not actually alive, as long as it is not rotten.

Many species of birds will gladly help you out, especially as they are feeding their own brood in the Spring, and bee brood is a delectable and nutritious addition to their diet. In one day, I saw eastern bluebirds, white-breasted nuthatches, chipping sparrows, tufted titmice, house wrens, downy woodpeckers, Carolina chickadees, and an occasional robin taking brood from my combs. The birds eat the mites, too. Maybe they give a little extra spice to the meal. We saw lots of baby birds in our yard this year, including two broods of bluebirds, with five babies in each. The birds benefit from this process as well as the bees!

Bees are going to make drones, whether you encourage them or not. If there is nothing but 20 frames of all-worker brood in the hive, the bees will cram in the drones anywhere they can – corners of frames, patches of – bullet brood? and lots of burr comb between the boxes.

Giving the bees plenty of room for drone comb greatly reduces the amount of burr comb between the frames and between the boxes, making the colony much easier to manage, an added benefit of this technique. As an extra bonus, it seems that queens love to hang out on these drone-comb frames, making them much easier to find. I need to find queens when I make up nucs, so if she is not in the middle of the brood nest, I look on the drone comb and find her there nearly half the time.

Should you use one or two drone frames? Scientists tell us that honey bees building natural comb make about 8-20% of it drone-size cells. A single medium frame in a deep box leaves a three-inch space, about – of a frame or 1/30 (3.33%) of a box, or 1.67% of the whole hive. Often, this much space is enough to prevent burr-comb building, but perhaps two frames per hive or even two per box would be worth trying. Using shallow frames allows even more space. There is definitely room for fine-tuning the technique, and testing different amounts of drone space would make a nice research project.

To identify the frame with the drone comb below it, marking the top of the frame with a permanent marker works well but needs to be redone every few years, as propolis covers the mark eventually. A big thumb tack in the top bar would work as well. Of course, tilting up the top box makes it obvious which frame to pull.

Being a backyard beekeeper, I can afford to spend a little more time per colony than a bigger operator could. I do not automatically cut out the drone comb in every hive. I assay it first by removing some drones with a cappings scratcher (one of those fork-like tools with about 20 tines) and examining the pupae and the empty cells for *Varroa*. If I find more than two mites in 20 drones, I cut the comb. If not, I leave it alone. Any colony that controls mites on its own deserves to have the chance to spread its genes through its drones. When I raise a few queens, I want drones from those colonies available for mating.

A few years ago, I discovered this early-drone-brood-removal technique when I came across a colony that was loaded with *Varroa* in March, as I found when I did a drone-brood test. (There is a detailed step-by-step photo series in *Beekeeping for Dummies*.) Three weeks later, another inspection found not a single mite in the brood I tested, and the colony did well that year. Testing the effectiveness of the early-drone-brood-removal technique in a controlled experiment would also be worthwhile. My experience would be considered anecdotal, not scientifically proven.

I am pleased to be able to share a good idea with other beekeepers as a thank-you to those who have guided me and others in the past. If you have a good idea, be sure to pass it on. BC

McDaniel Photography, mcdanielphotography.com.

Package Bees –
Producing, Shipping, and Receiving

Getting packages from the producer to you – quickly and efficiently

James E. Tew

Some of my earliest memories of commercial beekeeping were visiting queen and package producers in South Alabama and Southwest Georgia. I'm not referring to some foggy event in the early 1900s, but only as far back as the early 1970s. Nearly every queen rearing book published in the U.S. have spectacular photos of long rows of baby nucs or photos of cell building yards from some of these operations. Many of those businesses are gone now. At the time, I was so moved by the vista of bee hives and bee work going on that I offered to work for one of the commercial operations – full time. Showing experience and wisdom, the owner told me to stay in school, get a degree in entomology and then see how I felt about spending my life shaking packages. He was right. I never went back. I'm not lazy, but it must be said that raising queens and shaking packages is hard work - but then again, what part of commercial beekeeping is not hard physical work?

Though much has changed since the 1970s in the U.S. package and queen production industry, some things are still exactly the same. The essential goal is still to get three pounds of bees, with a new queen that's confined in a separate cage, into a shipping package that includes a feeder can, nail the whole contraption together, and get as much money for it as is decent. Nothing has changed there.

Another thing that has not changed is the process of buying and hauling bee packages. That continues to be an adventurous trip every time. But now that package prices are creeping upward and predaceous mites are trying to eat themselves out of hive and home, hauling packages is more important and more serious than it once was. In past *Bee Culture* articles, I discussed some of the issues faced by people hauling small loads of bees. Bee wranglers who haul large loads of packages have exactly the same concerns as the beekeeper who only hauls a few packages – only the scale of the potential problems are much greater for the larger hauler.

Producing and hauling package bees is an unusual occupation.

Order Early

It doesn't matter if it's only a few packages or if it is a thousand packages, ordering early is a safe recommendation. "Order early" – in comparison to what? Hardly 10 years ago, packages could be ordered in late Winter or even early Spring by beekeepers in the northern-most parts of this country. That order time frame has been pushed back to September-October of the previous year – especially if it is a large order. Commercial package shakers can't buy from each other the way they once could to make up emergency orders. Few bee companies have extra packages any more.

Here's a short story from by-gone years. I got a call in 1982, from a commercial package producer that had far more bees than he could sell. If I would pay for the wooden packages and feeder cans, he would give me the bees and haul them from the Southern U.S. to Cincinnati on another load he had coming to Ohio. This was all a donation to my program, but I still got nearly 100 packages for the cost of the shipping crates (at the time about $2.50). In order to maintain production control, he was prepared to shake the bees out and suffocate them – or donate them to a university. Those days are gone!

Money is always money

Arrange for method of payment on the first call. Agreements vary widely, but for large orders, some down payment will be required. Frequently, the entire order must be paid two weeks before shipping. Few producers ship COD. The actual form of funds transfer will also vary – check, money order or credit card. Clear that up early on. Some producers will allow orders to be split into smaller shipments in order to qualify for the quantity price break – if the entire order is paid for at one time.

If all parties agree, there are normally some package size options available to the bigger customer that may or may not be available to the smaller customer. In past years, two, three, four, or five pound packages have been available. In recent years, there has been increased reluctance to sell packages much larger than three pounds. This has been an effort by commercial producers to sup-

Packaged bees – shipped in good shape and ready for installation.

ply at least some "product" to all customers. Though five pounders have always been more expensive, in heavy nectar crop locations, the colonies build up much faster and provide for a heavier surplus. It's no secret to established commercial beekeepers that reusing last season's empty packages can save significant money. The truck is going down empty anyway. Why not just reuse them? Bear in mind that package shaking cannot start until you get there with the empty packages. Time spent waiting could cost more.

Bulk Bees

I haven't heard anything about "bulk bees" in many years. Essentially, the holding cage is very large – able to hold many pounds of bees. I don't know that there ever was a standard-sized bulk bee container. Bulk bee cages served very specific needs. Occasionally, a package producer would bring back this large container of bees and make up smaller packages at the home shop. Other uses included a commercial beekeeper buying bulk bees to supplement the overwintered population of his colonies. Occasionally, large beekeepers would make up their own packages as they went along from bulk bee cages – without the hassle of all the individual shipping cages in the yard. If you have not worked with bulk bees before, you probably have a great many questions such as: "Don't the bees drift badly?"; "How do you get the bees out of the large cage?"; "Do they overheat easily in the big cage?"; "How do you keep them fed in the big cage? – and on and on. All those questions and many more must be resolved with answers that are not readily available. This means for most of us, even the larger customers, that we just pay more money handle the smaller individual cages.

The Vehicle

Bigger loads present bigger potential problems. A pickup truck transmission failing is bad enough, but to drop the transmission on a five to 10 ton straight freight truck is not a simple Thursday morning repair job. Things go wrong in spite of the best plans, but the truck for the trip should be dependable. I have no illusions of that being new advice, but here's the increased risk . . . in years past, if the load was lost, there was a good chance that bees could be re-purchased – expensive but doable. Currently with the heavy demand for packages and the required early ordering date, there is an excellent chance that the bees could not be replaced. Then what?

The truck needs to have a smooth suspension system. We once used a 10-ton truck to haul research hives to North Florida. The truck was essentially empty except for the hives and our research equipment. It was a very rough ride both ways. During a subsequent presentation, I made the comment that, "the truck rode so rough that we had to pull off the road the change the radio station." That statement was very nearly true, and I have had numerous drivers tell me they knew exactly to what I was referring. Packages take up a lot of space but don't really weigh a lot. The rough ride on a truck with a heavy suspension can keep the clusters broken and bounce the sugar syrup from feed cans causing a general mess.

The U.S. Postal System

Presently, the only other common way to get bees besides making a trip for them is to have the postal system deliver them to you. This system of delivery will only become more expensive during future years. Presently, bees are in the same shipping category as worms, crickets and poultry. As you should expect, bee shipments have been considered to be hazardous cargo by some in the legal community. If that concept develops into something concrete, that will only make bees even more difficult to ship via any method. Either way, bee package customers are going to be required to pay considerably higher shipping rates.

Producer-Delivered Packages

Occasionally, toward the end of the shipping season, commercial producers have hauled packages to a prearranged central receiving point. I even referred earlier in this article to a load coming to Cincinnati. But these trips come at the absolute busiest time of the year for the package producer. These people are literally shaking packages night and day. Then, without much rest, they load up and drive night and day. Not an easy job. It has been postulated that state beekeeping groups could really come into play here. They could organize the package order, place it, guarantee payment, and then selected members make the trip. Renting a truck from a national chain, though a bit pricy, provides for an insurance policy. If the truck fails, it would be possible to get another and get back on the road. Alternatively, the club group could drive a private truck, but be aware, if that truck should fail, a rental truck could be rented as an alternative. Any truck, driven by anyone, should have excellent ventilation. Upper ventilation ports within the truck box are excellent. It may be that bee clubs or individuals could devise a

trailer or individuals could devise such a trailer and haul bees for hire. This is clearly an area for entrepreneurial beekeeping development – the future *Road Wranglers of Package Bees.*

Becoming a Package Bee Hauler

There is no clear outline for what one should do to haul large orders of package bees. Start with a small truck. Make a few runs. Talk to others. Be creative. Let the size of the package order grow as your experience grows. Everything is a variable. During the off-season, most package producers will talk to you and help you devise a hauling plan. Through the years, I have enjoyed hearing commercial beekeepers tell some of their many stories describing creative vehicles and trailers for hauling package bees. You probably can't do anything that has not been tried before. Package producers realize better than anyone the way packages are produced and distributed. Even without mites, the cost of shipping bees would have gone up, and these trends of independent haulers would have developed. Mites and Colony Collapse Disorder have made package bees more precious and, therefore, have sped up the process of developing alternative methods of shipping bees.

Package Haulers of the Future

What will package bee production look like 10 years from now? How will be bees be hauled ten years from now? Certainly, I don't know. Package producers generally say that they are shaking all the packages they can right now. If the market is there, why don't they grow? The answer seems to be primarily in finding experienced labor. It is outright difficult to find competent seasonal labor. Secondly, it really helps to inherit a bee package operation rather than to build one. If you're going into commercial beekeeping, why go into package and queen production when you can make a similar income producing honey or providing pollination services? Queen and package production is intensive. The efficient operation has two of everything – two can sealers, multiple pieces of pneumatic equipment, trucks. There is not enough time to get anything repaired during the height of the shipping season. Thousands of baby nucs must be maintained or built (at around $25 - $30 each). Sources of screen wire and wood must be dependable and prices established. Then there's office equipment and staff, field laborers, advertising, web pages, and phones (the phones are necessary for both your orders and your complaints). Most importantly, thousands of colonies of bees must be maintained in 50 - 60 different locations. Yet, without someone producing packages and queens, our industry would have a very, very different look and feel. If there's money there, someone will produce and haul these bees for us. Maybe it should be you. BC

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Adverse Effects Of The "Patty"

Visualize the rounded top of the cluster as a blunt spear to penetrate upward in periods of brood nest expansion.

Walt **Wright**

Reviewing my list of possible article subjects, there are two items that could be integrated into one submittal. "Why use patties?" and a "description of the brood nest dome" are interrelated and can be treated as a unit. This discussion will treat them in reverse order.

A discussion of the shape of the top of the colony brood nest may seem like a nothing subject. The literature would support that impression. You won't find much on it there, but it's important to the bees. I remember writing somewhere that honey bees majored in physics and minored in mathematics. That tongue-in-cheek statement would be revised today to include a second minor in chemistry. Not relevant.

Here we want to explore the colony's application of the physics of heat rise. Try to visualize the rounded top of the cluster as a blunt spear to penetrate upward in periods of brood nest expansion. Too far out for you? Sorry. We'll go on without you.

Through the Winter and into the Spring buildup excess bees congregate at the top of the cluster. The insulating band around the cluster is thickest at the top. Dr. Farrar's sketches of cluster cross sections in Wisconsin Winters snow nearly twice the thickness of the insulating band at the top. This has several benefits in conserving their heat generated in the cluster interior. The extra thickness of concentrated bees at the top tends to block or cap the brood nest heat rise – a definite honey conservation measure.

Let's spend a few seconds on heat rise. Heat generated at the outside tends to fold inward to concentrate in the center of the source. Sticks on the outside of your campfire go out – the heat to support combustion is directed inward. The heat rise of the campfire is centered. This is no less true for the lower heat levels of the brood nest. You can often see a column of bees active above the center of the brood nest at very cold temperatures. Are you beginning to see "spear" effect on colony growth?

As the population grows in the early buildup, more bees accumulate at the top. The increase in concentrated bees at the top serves at least two major purposes. First, they have to condition the overhead honey for expansion that they intend to grow into. Their overall survival format allows for contingencies. If the honey immediately overhead has granulated, it will expedite expansion to liquefy it. Although honey is reported to liquefy at brood nest temps, it's a slow process. At least, I didn't have the patience to confirm that it might be true. It even takes several hours to liquefy my honey at 130°.

Later in the buildup the established colony must develop wax making capability. During the frosty morning period of swarm preps, into late Winter, they must build a large corps of wax makers. Establishment of the swarm in a new location goes nowhere without comb for stores and brood. It is reported in some obscure literature that wax makers need at least 100° to generate wax with their wax glands. That's well above reported brood nest temperatures.

One could conclude that the concentrated bees above the brood nest actually increase the temperature there. It might be the metabolic heat of each bee in proximity or perhaps the increase is deliberate by some action. Not that it matters, but accumulated body heat can be significant. Over the years, I have lost two colonies in transport with a screened top and entry. The bees, wanting out, built a barrier to air flow. They didn't suffocate, but melted down in their own body heat. Just didn't realize the populations of the hives. Marginally relevant.

Both the liquefying of honey overhead and the generation of wax makers would be supported by accumulation of bees above the brood. Note that the accumulation is also dome shaped.

> If you look at the incremental brood nest expansion – it comes in steps. The colony consumes the liquid feed overhead, prepares those cells for brood, and populates those cells with eggs as a batch. The band of cells for that increment of brood nest expansion is normally the widest at the top and the width trails off away from center. That maintains the brood dome shape through each step in expansion.

The intent of the forgoing was to describe how the shape of the brood dome contributes to the centralization of the heat rise. You know about the shape of the dome – you see it essentially all year, every year. You also see the effects of the colony preference for working in the heat rise from the brood nest. Even in the main flow, outside frames of honey supers are the last to be filled. However, working in the brood nest heat rise is more significant in the early, cool weather period of buildup. Obstructing the heat rise slows colony growth. Slowing colony growth is not in your best interest. Stronger colonies make more surplus.

As long as the obstruction stays in place colony growth is impaired. Regardless of how well-intentioned the obstruction was, you have "shot yourself in the foot" from a honey production standpoint. The Mite Away II® pad, ➤

for example, is recommended to stay in place for two to three weeks. Seeing the effects on colonies, made me want to remove it in the minimum time of two weeks. No overhead growth for two weeks is a significant impact in my area with a short build up time in the "explosion" period of growth.

The "experts" continue to over look this feature of colony development, and that is reason enough for you to "think outside the box", it is not mandatory for you to follow the one with the bell on – like goats. It is permissible for you to think about the effects of what you do. There are many ways to treat or feed your bees without shutting down colony growth. I'll offer a couple that I have tried with success. If you have the capacity to think, you'll come up with others.

Patties, pads, or pillows have been used for a long time to feed or treat colonies for pests. Recommendations for use usually direct you place the item directly over, and close to, the top of the broodnest. What happens? Brood nest heat is deflected by the obstruction to the outside fringes before it can turn upward. Not only is the heat rise weakened by dispersal, but it disrupts the colony instincts for building up and out from the center.

The T mite penetrated my area in my second year of beekeeping – lost eight of 10. Menthol crystals were being touted at the time as the best treatment. When I called the supply house to inquire how the packets were used, the order-taker at Kelly said she didn't know, and didn't refer me to anyone else. She mentioned that a beekeeper in Texas was having success with grease patties. Okay, I know how to do grease patties – I'll try that first. The first season, standard patties were used, sandwiched between sheets of waxed paper per instructions. After that first season when it appeared to help, the application was streamlined to trim unnecessary time. The bucket of grease mix was taken to the beeyard and a couple of scoops scattered on the top of the brood nest, top bars. Some falls through to the bottom board. It's much better than patty application for many reasons. Better distribution of the grease film that kills mites (both kinds). It's cheap and quick. Food grade ingredients can be applied at anytime you have colony access. Does not seem to affect colony operations. And relevant to this submittal, it does not interfere with brood nest heat rise. It's still my primary line of defense against mites.

An aside: I find it difficult to believe beekeepers are still using menthol packets. Do they not see the affects? When I tried them half the brood area shut down. The only brood was in the other end of the brood chamber. The bees can't stand the overpowering smell. Fall, when the colony needs to rear young bees for wintering, is not the time to limit brood rearing. Couldn't get those menthol packets out of the hive as fast as I would have liked, but they wintered ok. But bees are quite resilient to abuse. The packets, when removed, were coated with propolis in an effort to contain the overpowering stench. I wonder what would have happened if the packets had stayed in until the pellets completely vaporized. I wonder, but I really don't want to know. End of aside.

Back to the subject: In the '07 season where a late freeze stopped field pollen for three months, wanted to see if the colonies would take some commercial protein supplement – ordered just in case. The sticky mess (overshot the doughy consistency with too much sugar water) was placed on three inch strips of wax paper and placed on both ends of the brood chamber. The "main flow" was already in progress and the foragers were bringing nectar.

Dare I digress again so soon? The foragers prefer to travel through the brood nest. They could easily circumvent brood nest congestion by traveling up/down on the inside walls of the hive, but they don't. Instead, they will cue up above and below the brood nest waiting their turn to get through. My guess is that passing though the brood nest improves communication between the decision makers of the brood nest and status of field conditions as seen by foragers.

The narrow strips, fore and aft, permitted the colonies to do it their way. The foragers could travel through the brood nest and work in the overhead heat rise from the brood nest. Incidentally, they devoured the protein supplement. They were desperate. A week later, the only evidence of having had it at all were a few shreds of wax paper out front. A second dose at that time, provided the same results. However, later in the season when field pollen was available, they took little interest in an identical offering.

To close, let me start you thinking about alternative ways to avoid blocking the heat rise from the brood nest. Although the Tennessee Crackpot has not tried them, a couple ways come to mind. Cutting the patty into strips or pie slices might be effective. With open spaces between the strips or slices, warmer air would not be diverted to the outside. BC

Walt Wright is a student of honey bee biology, and a sideline beekeeper, living in Elkton, Tennessee.

TANGING?

Peter Sieling

You never know what to believe when looking up information on the internet. That's why I always take my bee questions to the Steuben County Honey Bee Association. That august group of sages represents over 900 years of beekeeping experience. After a 10 minute business meeting, the president opens the floor to questions. The discussions can last over an hour, drifting from topic to tangent until no one remembers the original question.

Take tanging for example. That's the custom of beating on pots or ringing bells to bring down airborne swarms. It's hard to believe, but some, even scientists and professors at our best universities, think it's a myth.

"Oh yes, that's a good way to bring down swarms." The old timers nod their heads as though they've been tanging since they wore knickers.

"It doesn't have to be a pot, though," explains Jesse. "It's not the sound so much as the rhythm."

"The old John Deere tractor engines pull 'em right down," said Lash. "My neighbor had a swarm land right on his tractor, back in '67 or '68. No, wait! It was '66, the year of the big snowstorm."

"I've heard John Deere tractor engines work," mused Fred. "What about an Allis Chalmers – would that work? I always wanted to try it but never could get it to start when a swarm was coming out."

"No, it has to be a John Deere. It's that two cylinder sound they make," explained Lash. "That's why they're called 'poppin' johnnies'."

"I don't know about that," said Don. "A barking dog will bring down a swarm. My neighbor had a colony living in the tree next to their house. It started swarming and their dog – I think his name was Duke, or maybe Buck – I can't remember – he was a German shepherd or maybe a Rottweiler – anyways he started barking. The bees landed right on the dog – stung him to death."

"Why didn't the dog run away?"

"He was tied." (Fifteen minutes ensue discussing the pros and cons of tying dogs.) The general conclusion is that dogs shouldn't be tied near a colony of bees. Better yet, keep them inside during the swarming season.

"I don't believe in tanging," Dick said. "I tried it once. The church deacon asked me to get some bees out of the church steeple. I put on my bee suit, set an empty hive on the sidewalk and beat a pot for 30 minutes. Not one bee came down!"

"Was it an aluminum pot?" Lash asked. "I heard aluminum won't work."

"It was steel – one of those with the copper bottoms."

"That should have worked. Why'd you stop after 30 minutes?"

"A policeman asked me to leave. He said some folks were worried about me. I guess they were afraid of the bees."

"You can't tang bees out of their nest! It has to be a swarm. They say they won't leave if there's brood," said Don.

"All I know is I beat that pan for half an hour and no bees came down." Dick started to look annoyed. Twenty minutes of discussion yielded a general conclusion that you tang swarms and drum colonies. Drumming the sides of a colony causes the bees to climb up into an empty hive. If Dick had cut the steeple point off, set an empty super on top and beat on the steeple for 20 or 30 minutes, the bees probably would have moved into the super.

"Why does the tanging bring them down?" asked Sue. She's one of the club's novices. Having bees for only five or six years, Sue never heard of tanging.

"They think it's thunder," said Fred. "Bees don't want to fly in a thunderstorm." That led to a 20 minute discussion on the size of a raindrop compared to a bee. The conclusion was that hitting a bee with a raindrop was like dumping a five gallon bucket of water on a man in a hang glider.

Never having tanged myself, I didn't offer an opinion. The clock moved slowly and there was great danger of extending the discussion far into the night.

Later I consulted *Langstroth's Hive and the Honey-bee* – "The ringing of bells, and beating of kettles and frying pans is probably not a whit more efficacious, than the hideous noises of some savage tribes, who, imagining that the sun, in an eclipse, has been swallowed by an enormous dragon, resort to such means to compel his snakeship to disgorge their favorite luminary."

It's hard to believe a man of Langstroth's towering intellect could be so wrong. But then the folks of the nineteenth century, without access to modern science or the internet, were full of myths and superstitions. BC

Peter Sieling tangs swarms, makes equipment and will demonstrate his woodworking and wood finishing techniques at EAS 2009 in Ellicottville, NY.

Rabbits, Turtles and Bees, Oh My!

Turtles and healing honey at the Georgia Sea Turtle Center

Jennifer **Berry**

Last Summer I rescued a tiny baby rabbit. His nest had been invaded and his two siblings killed by a coyote, raccoon or some other predator. In a panic to save this little guy I turned to the internet for help. I typed in "what to do with a baby rabbit" and immediately the information appeared. It said that baby rabbits are extremely delicate and will most likely die unless handled by a person trained in wildlife rehabilitation. Not being certified in that area I contacted a trained professional and she agreed to take the precious little guy off my hands but I would have to drive the 120 miles to meet her. No problem.

I packed him into a box with the remains of his nest and took off like a bullet. Of course during the ride I continually stuck my hand into the box to see if the noise of the truck or the sound of that ambulance racing by or the drama of being removed from his nest hadn't just sent him into shock. So far, so good. About half way there, speeding down a windy country road, I ran over a medium size turtle, literally. He was in the middle of the lane and I missed him completely. A sigh of relief was quickly replaced with, "Oh my, he'll be surely hit if I don't pick him up". It was just after 5:00 p.m. and the traffic on the road was horrible. But as I drove away, I looked in my rear-view mirror and saw the little guy still hunkering down as the car behind me barely missed him. About a mile down the road, there was a place to turn around. Cars were racing by as I waited, for what seemed like hours, to get back on the road. I dreaded the fact that he had probably been hit by now. I got a break, pulled out and raced back. There he was, still in one piece and not moving. I pulled over on the side of the road. Again it seemed like hours before I could even open my door to get out due to all the cars whizzing by; but the turtle was still alive and I wasn't about to sit and watch him die. Finally there was a break in the traffic. I jumped out, ran across the road, scooped him up and made it to the other side just as the pickup truck sped by blasting his horn. Guess he wasn't too happy to see someone in the middle of the road as he came around the corner. But the turtle was safe and unharmed, however now the task of getting back to my truck. Hmmm? Just to let you know, the little rabbit made it and was successfully released and so was the turtle.

Ok, rabbits, turtles, what does this have to do with bees? Well, actually you'll be surprised. Last December I spoke at the annual Georgia Farm Bureau Commodities meeting at Jekyll Island. Right after I spoke Dr. Terry M. Norton, DVM, from the Jekyll Island Sea Turtle Center gave such as interesting talk I just had to find out more. Now be patient, much like the tortoise, and not the hare, to find out how sea turtles and bees are connected.

Dr. Terry M. Norton is the director and creator of the Georgia Sea Turtle Center. He received his BS degree at Mexico State University and his Doctorate in Veterinary Medicine from Tufts University in Massachusetts. He then interned in small animal medicine and surgery in Washington, DC. Next he completed his two year residency at the University of Florida College of Veterinary Medicine in Zoo and Wildlife Medicine and became board certified in the same field. Afterwards he worked for the White Oak Conservation Center in NE Florida, the Riverbank Zoo in South Carolina, and the North Carolina Zoo, focusing his attention on what he loved most, zoo and wildlife medicine. During this period he would also travel to St Catherines Island every two weeks to provide medical, surgical and preventative health care for a variety of endangered, captive mammals, birds and reptiles. St. Catherines Island is a 10 mile long island owned and managed by the St. Catherines Island Foundation. The island is located off the coast of Georgia and a center for endangered species breeding and research.

Working in wildlife medicine Dr. Norton realized that a native wildlife health program was desperately needed for coastal Georgia. Thus, he ambitiously went to work. From 2001 to 2006 the Georgia Sea Turtle Center slowly began to materialize. In February 2006, renovations began and in June 2007, the Georgia Sea Turtle Center, a marine turtle rehabilitation, research, and education facility, opened on Jekyll Island. After six long years the vision was now reality.

Prior to the center opening, injured turtles were shipped to facilities in Florida, South Carolina, and North Carolina. Now Georgia has a facility

that has the ability to "not only provide state of the art emergency care to sick and injured turtles but also opportunities in research and long-term treatment."

Another goal of the center is to engage the public and offer educational programs by increasing the "awareness of habitat and wildlife conservation challenges, promote responsibility for ecosystem health and empower individuals to act locally, regionally, and globally to protect the environment." Not an easy task but well worth the effort. Education is a powerful tool and the center strives to educate anyone willing to listen. Once you create awareness about the plight of our environment, folks understand the urgency and become involved. If people can make the connection with nature, they take this home and become more active in conservation.

With the continual development of coastal areas, turtles and other marine life are losing their nesting and breeding sites. Plus with increased human population along the coast comes the desire and need to be entertained and fed. Hence the number of boats and jet skis increase to meet these demands. One of the major problems marine life faces is fishing gear entanglements. Birds, turtles, manatees, etc may become entangled in the gear which may eventually lead to severe injuries and even death. They may also ingest hooks, lines, and lures. Dredging and trawling activities also take their toll. Propellers are another danger which causes about 20% of the injuries observed in turtles.

Approximately 300 terrapins on the Jekyll Island causeway alone are hit by cars during their nesting season from May to July. The terrapins are attracted to higher ground for their nesting and the causeway forms the perfect habitat for this. Unfortunately it is a death trap for the terrapins if they try to cross.

Various pollutants such as runoff from golf courses, lawns, sewer systems, roads, the fuel from boats, and sediment from dredging compromise the health of sea turtles and other marine wildlife. The ecosystem created is now out of balance (similar to what we are seeing with CCD). Not only are sea turtles affected and declining in numbers, but 1000's of other species, all interconnected, are affected as well. The center was established to address these issues that disrupt coastal areas and coastal wildlife.

In June of 2008 a large loggerhead turtle was found with a severe propeller injury. The propeller had sliced through the leg and shell of the turtle. Early prognosis wasn't good. He was named Duffy. Now imagine a gapping wound from a propeller that has sliced through the shell of a turtle. How would you possibly mend that? There is a machine called a VAC that is used to help heal non-healing wounds in humans and animals. It rests directly onto the wound where the suction created promotes and improves blood supply to the area while pulling out debris and infection. It permits healthy tissue to form allowing the wound to heal faster. However, this can only be used on land, not in water. So when applied to aquatic turtles they need to be removed from the water. It is stressful for an aquatic animal to be out of the water.

In the past, Dr. Norton had used honey for wound care in other animals, so he applied honey to Duffy. Unfortunately, the honey kept washing out because the turtle was returned to a water tank. A student worker at the center, Katie Haman, suggested packing the wound using honeycomb to hold the honey in place. Sure enough it worked and the wound began to heal. Duffy will be released back into the ocean this May.

The newest patient at the center receiving honey treatments is Varun, a green turtle. He was brought to the center with a horrible injury; a deep gash caused by a boat propeller that exposed his lung and body organs. Again, the early prognosis wasn't good. The process for healing Varun's wound is using sterile gauze with honey. They are used as bandages to aid in healing burn victims or diabetic wounds. These MediHoney gauze bandages don't come cheap. They run $10 a strip and can only be used for one day. While interviewing Dr. Norton he told me that the day before his visit was the first day the Varun's injuries were beginning to improve.

Honey, especially in other countries, is routinely used to treat all

Dr. Norton examining an injured turtle.

Duffy's wounds after being treated with honey.

Rehabilitated turtle being released back into the ocean.

sorts of maladies in humans, including healing wounds. Honey inhibits the growth of most bacteria because it produces hydrogen peroxide when exposed to tissue. Here is a simplistic overview of the process. Honey by itself has a low pH of around four, so it's acidic. Depending on the floral type, honey averages about 30% glucose. While bees are ripening honey they add an enzyme, glucose oxidase, to the honey. This enzyme oxidizes glucose and forms gluconic acid. The acid formed aids in the stability of honey against fermentation. Also, for every molecule of glucose oxidized one molecule of hydrogen peroxide is formed. This too helps keep the honey from spoiling. When skin and body fluids are treated with honey the environment is just right for the glucose to break down and release hydrogen peroxide. These antibacterial properties from the creation of hydrogen peroxide help wounds heal faster. Remember that nasty cut your mother poured liquid into while you writhed in pain? More than likely it was hydrogen peroxide and it was killing all sorts of bacteria, which was a good thing even though it didn't seem like it at the time.

Injured sea turtle at the center.

Since the center has opened 18 sea turtles have been successfully rehabilitated and released. Currently there are 12 sea turtle patients. Most of these will be released in late spring. As of May 31, 2008, Dr. Norton and his staff treated 256 diamondback terrapins with 69 releases. They have hatched 131 terrapins from eggs recovered from dead or injured terrapins. Roughly 52 turtles (freshwater, gopher tortoises and box turtles) have been treated at the center.

Along with Dr. Norton, the sea turtle center is staffed with a hospital coordinator, three rehabilitation technicians, a husbandry intern, an educational coordinator, an education and outreach coordinator, a education and volunteer coordinator, a marine field program coordinator, several interns, a gift shop manager, hourly employees and hundreds of volunteers. Rescuing wildlife takes people with passion and knowledge.

This year Dr. Norton was selected to join the Institute for Georgia Environmental Leadership. The Institute was started in 2001 to create a diverse group of state environmental leaders to work together and address environmental challenges in the state of Georgia. And it doesn't stop there. He has been awarded 12 research grants, collaborated on numerous research projects and has served on many national committees. He is an Adjunct Professor at the University of Florida, North Carolina State University and the University of Georgia Colleges of Veterinary Medicine. He has published 35 articles and is the associate editor for the Journal of Zoo and Wildlife Medicine. In 1992 Dr. Norton was honored by being awarded the distinction of Diplomate in the American College of Zoological Medicine. Dr. Norton also organizes, teaches and lectures to groups ranging from the general public, to local veterinary associations, to zoos, to universities, scientific meetings and even beekeepers.

If you ever find yourself visiting our lovely state take a day or two and go see the center.

It is open to the public Tuesdays through Sundays. Admissions collected help with operational costs along with the expense for rehabilitating the injured or sick patients. Check out their website for more information. www.georgiaseaturtlecenter.org

Quoted lines in this article were taken directly from the Georgia Sea Turtle Center's website.

See Ya! BC

Jennifer Berry is the Research Coordinator at the University of Georgia Bee Lab. To comment on this article: Jennifer@BeeCulture.com.

Easy Cut Comb Honey

No extra equipment, similar management

Bob Darrell

I am a small scale beekeeper (never more than 20 hives) and I sell all my honey from my home. I live and keep my bees beside the Credit River in The Forks of the Credit, Ontario Canada, about 60 miles northwest of Toronto. I use standard 10 frame langstroth hive bodies with only nine frames. My reasoning, which has been confirmed many times helping others with their bees, is that you can hardly remove frames (self spacing) from 10 frame brood boxes without gelignite or some other brute force method. My honey supers (mediums) are all equipped with nine-frame frame spacers. I still use the four-frame stainless extractor I bought more than 30 years ago which presents a problem in that there is always one frame left over after two loads are extracted. I considered going to eight-frames in each box as I had read that more honey is stored in eight-frames than in nine or 10. However I recently read that the number of frames per box should be consistent throughout the hive to help with ventilation (the spaces between the frames should line up from top to bottom of the hive). As most of my hives are singles I thought that eight frames for brood is too limiting.

I also wanted to produce comb honey so I bought some cut comb foundation and replaced the centre frame in each honey super so that now I had eight frames (two extractor loads) of extracting honey, and one comb honey frame per super. Being frugal (I used to say cheap but friends in Ireland corrected me) I started using less foundation in each comb honey frame and found that the bees made the cells larger below the foundation. Eventually I inserted frames with no foundation. Now I get lovely frames of large cell comb honey without the crunchy bit in the middle. The empty frame has to be between two drawn combs otherwise you get a mess. When a flow is on the bees draw the comb, fill and cap it before they finish the outside frames. I once needed some comb honey for a customer who wanted fresh comb honey, not frozen, so I went to a hive I knew had a full frame shook the bees off, put another empty frame in its place and sold it to him for $20. When I extracted that super later, the new frame was completely full and capped. I started making comb honey frames out of scrap pine lumber after some of my comb honey got into the extractor by mistake. Now the comb honey frames look different.

An outfit in Ontario sells plastic comb honey trays with snap lids into which medium frame comb fits. While the extractor is running the comb is cut free of the frame onto a rack and baking sheet, that I purchased at a kitchen store, to drain the cut edges. Three or four cuts with a hot knife gives four to five pieces per frame. The packs are designed for 350 gms but will hold 500 - 600 gms if the comb is well drawn. Nine frames per super gives nice deep combs, eight frames would be deeper. Last year I produced 235 packs. After weighing, labeling and pricing the packs go into the freezer to keep them nice until sold and to kill any wax moth eggs that might be tagging along (I forgot to tell the fresh comb man about wax moths but I guess he was ok). Most people don't know what comb honey is and what you do with it. For this reason I make some packs smaller as I find that people will spend up to $5 to try something but will resist spending more. Comb honey lovers want the biggest nicest pieces. I discount pieces with some open cells or are misshaped but charge between 1.5 – two cents per gm ($6.50-$9/lb.) for nice pieces.

A disadvantage I have found with single brood chamber hives is that the bees use the first super above the queen excluder to store brood food. As a result the comb honey frame gets travel stained and is less attractive. Also, Canadian label rules require a notice if cells of pollen are in the comb. While pollen may be present in any super, it is definitely present in the first super above the queen excluder. To eliminate these problems I leave a honey super with nine extracting frames immediately

My comb honey frame is in the center. It stands out because I make them myself.

above the queen excluder.

Comb honey is not readily available in this part of the country. I often have people call from the city for directions as someone has told them that I sell it. Some people buy it because they always had it when they were kids, others because they are looking for food with minimal processing. Because my comb honey sales have increased every year I am reluctant to change my extractor as I would loose the advantage of the comb honey frame in the middle of every super that I discovered by accident.

I like trying new ideas and continue to use some that worked for me. Many of the best ideas for me came from other small scale beekeepers. Ziplock bags for feeding syrup and producing creamed honey in the freezer are two that come to mind. Screened bottom boards for mite control and mite-wipe pads for Formic acid treatments were developed by researchers but are used mainly by small beekeepers as they are too labor intensive for larger operations. I appreciate the opportunity that the Editor provided when he asked me to write this piece and hope that he will continue to look for new and different ideas from small scale, but inventive beekeepers. BC

A perfectly capped comb honey frame with no foundation used. The filled cells are large and uniform.

My rack and baking sheet the removed comb sets on, and drains into.

Comb removed from the frame, ready to cut into large, or small pieces.

Using a hot knife, the comb is cut into smaller pieces, and all the pieces are left to drain. Overnight isn't too long for thick comb.

Once the pieces have drained, they are put in the convenient plastic containers, weighed and priced.

The finished product sells for between $6.60 and $9.00 per pound.

EASY HIVE SCALE


A standard hive shown on the hive scale with the periscope in the stowed position.

In searching for an alternative to the scarce and heavy platform scale, I ran across this idea in an old text.

Allen Hayes

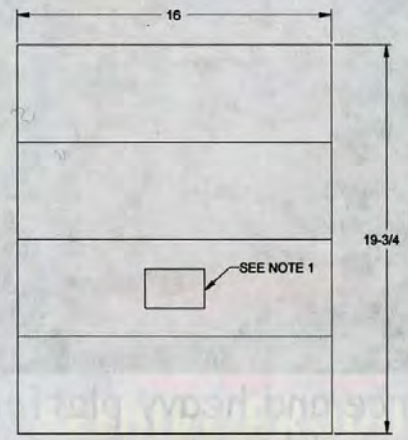
When I tell other beekeepers that my scale hive gained six pounds today, the first thing they want to know is, "Where can I get a scale?" I always suggest farm sales, auctions and my favorite, flea markets. But finding a suitable scale can be difficult and many beekeepers who would like one have to do without. But now by purchasing a cheap bathroom scale any moderately skilled woodworker will be able to construct the scale base described here and have a valuable beekeeping resource.

There is no better way to determine when a honey flow has begun, peaked and ended then to place a colony on a scale and record its weight daily. A three pound drop in weight in one day is pretty strong evidence that the colony swarmed. The weights should be recorded at the same time every day preferably at dusk because that is when all of the foragers are home and the hive should be at its heaviest weight for the day. Recording this data then comparing it from year to year sometimes reveals very interesting results.

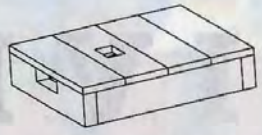
Probably the best scale to weigh bees with is the old beam type platform scale used by farms and feed stores. New versions of these are available but are expensive. Old ones can be hard to find but whether new or old, all of them are quite heavy. This makes them difficult to move, store and place in your apiary. In spite of their drawbacks these are very good as many of them record weighs to as little as ¼ pound. In searching for an alternative to the scarce and heavy platform scale, I ran across this idea in an old text. While it is not perfect I believe it to be a reasonable substitution. I have used one of these for two seasons with acceptable results.

You may find the periscope to be the most difficult component to build. The good news here is that you only need to make one. You can build several bases and move the periscope from one to another. That way you can track the progress of multiple colonies in your apiary. The scale you choose should be able to record a difference of about ½ pound though you may have to estimate the value if the indicator is between one pound marks. You need to buy a spring type bathroom scale, not a digital one. They can be found at discount stores for under $10.00. Don't let getting the mirrors cut to size scare you. I purchased one 12" square mirror tile from a home store and cut several out of it. A hardware store or glass shop can cut these for you if cutting glass isn't your thing. I suggest getting this done first then cut the slots in the periscope to fit the mirrors. In


The hive scale base, periscope and standard spring type bathroom scale.



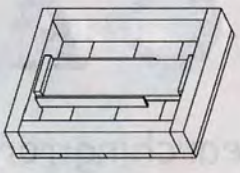
NOTES:
1. OPENING SIZE, SHAPE AND LOCATION WILL VARY, WITH SCALE BEING USED.
2. SUBSTITUTE TOUNGE AND GROOVE MATERIAL OR 3/4" PLYWOOD
3. NAIL OR SCREW COMPONENTS TOGETHER AS SHOWN.
4. CUT NOTCH IN ONE ITEM 1 ONLY.
5. ALL DIMENSIONS ARE IN INCHES.



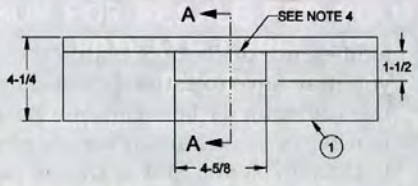
ISOMETRIC VIEW

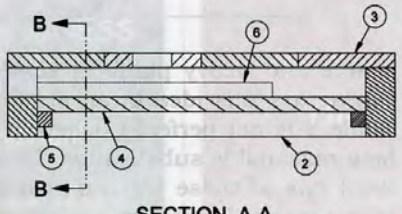
SEE NOTE 2

ITEM	QTY.	SIZE	DESCRIPTION
1	2	2" x 4" x 16"	WOOD
2	2	2" x 4" x 16-3/4"	WOOD
3	4	1" x 6" x 16"	WOOD
4	1	1" x 4-5/8" x 16-3/4"	WOOD
5	2	1" x 1" x 4-5/8"	WOOD
6	2	1/4" x 1-1/2" x 12"	WOOD

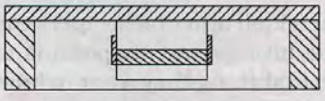


UNDERSIDE VIEW





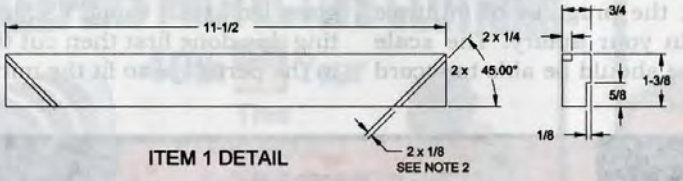
SECTION A-A



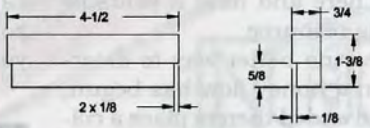
SECTION B-B

HIVE SCALE BASE

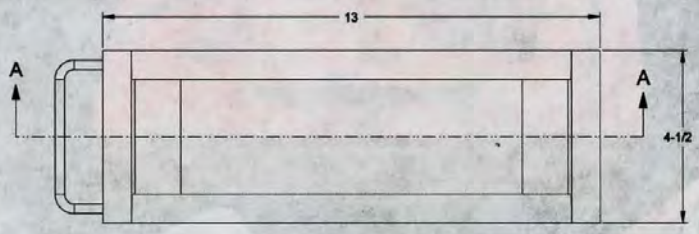
ALLEN HAYES



ITEM 1 DETAIL



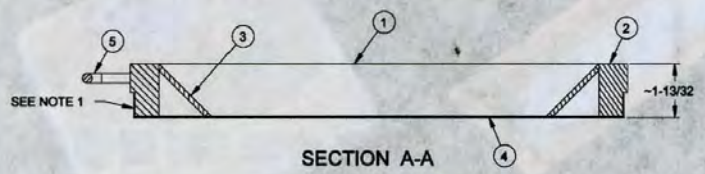
ITEM 2 DETAIL



PERISCOPE ASSEMBLY

NOTES:
1. USE FLAT HEAD WOOD SCREWS TO ATTACH ITEM 4 FOR ACCESS TO ITEM 3.
2. CUT TO FIT MIRRORS.
3. ALL DIMENSIONS ARE IN INCHES.

ISOMETRIC VIEW



SECTION A-A

ITEM	QTY.	SIZE	DESCRIPTION
1	2	1" x 1-3/8" x 11-1/2"	WOOD
2	2	1" x 1-3/8" x 4-1/2"	WOOD
3	2	1/8" x 1-5/8" x 3-1/2"	MIRROR
4	1	0.030" X 5-1/2" x 14"	ALUM. FLASHING
5	1	3-1/4"	PULL

PERISCOPE

ALLEN HAYES

addition to the materials listed on the drawings you will need an assortment of different size nails and/or screws to hold everything together. The scale needs to be secured to the base to keep it in place. I put four small blocks of wood on each of the sides and screwed them to the base. If you make these blocks too thick they will interfere with the scale's operation. Blocks that measure ¾" thick should work fine. Once you have the wooden components completed either brush on two coats of paint or exterior polyurethane to protect them from the elements.

While it appears that with this set up the hive may teeter when placed on the small scale, it is actually quite stable since the weight is balanced. I haven't had a hive fall over after two seasons of using this set up. But just to be sure, I use two ratchet straps around the hive from the underside of the bottom board to the top of the outer cover to hold things together should it topple over. The sun's UV radiation deteriates the fabric of the straps and after just one season they become too weak to use again. Since the entire weight of the colony must be supported by the center of the bottom board most screened bottom boards available today won't work. Instead I use the old solid type bottom board and for *Varroa* Mite control I use a screen insert. The "Beltsville type" screen insert that I use isn't shown in the photographs.

To set up your hive scale place the base on the ground or concrete blocks and make sure the base is level. Then place the bathroom scale upside down with the display over the hole in the base. Make sure the periscope is visible from the back of the colony not the front. Next place your colony on the scale and record the weight. Slide the periscope out until the scale indicator is visible then slide it back in for safe storage. Since there are two mirrors you can read the weights directly without seeing a mirror image. As you add or remove supers or other equipment accurately record the weight and either add or subtract that valve from the daily weight. Remember you are only interested in the daily change in weight, be it increase or decrease, not the total weight of the colony. I have found it best to use a flashlight to take the daily readings. Then about dusk every evening visit your scale hive and see what your bees have been doing all day. I am sure you will enjoy what you learn from weighing your bees.

The base with the scale placed upside down and located with four wooden blocks. The periscope is pulled out to the weight reading position.

For more information on the use of hive scales, data recording and how your scale hive data can become part of a national network visit honeybeenet.gsfc.nasa.gov. BC

Allen Hayes is an EAS Master Beekeeper and President of Maryland's Howard County Beekeepers Association. You can reach him at ***thehayeshouse4@aol.com.***

Every Beekeeper Needs A Notebook

Fred Hembree

Good Records Make Good Beekeepers

Several years ago an old beekeeping friend inquired, "Do you have a bee notebook?" I wasn't quite sure what he was talking about, so I asked him to explain. He shared with me how helpful it had been for him over the years to keep a notebook containing his thoughts, reflections and activities in his beeyard. He went to his old pickup truck and came back with a three-ring binder in his hand. It was simply a notebook filled with paper. At the top of each page he had written the date and what he had done or experienced in his apiary that day. He also had a section in his notebook for other items, such as where he purchased queens, ordered various pieces of equipment and a contact list of other local beekeepers. Needless to say, I was impressed! I did not have a bee notebook. But I decided that day that I was going to create my own.

I began to give some thought as to what I would include in my bee notebook. In keeping with the example given to me by my friend, my first section would be called "Apiary Notes." This is where I would write down what was done in our beeyard on a given date. Here is an example:

Friday, November 7, 2008

Checked all hives today and installed entrance reducers. Hives appear to be in good shape for the Winter season. Hive #3 may be a bit lower on stores than the others, but is probably ok. I will keep an eye on it.

Over time, these notes have proved to be very helpful. Want to know when you re-queened a particular hive? Look to your apiary notes. Did one or more of your hives swarm or did you catch a swarm? Record the date and the conditions leading up to this event. For instance:

Thursday, April 17, 2008

Swarm! Today is the first warm sunny day following a week of cooler temperatures and rain. Late this afternoon, I discovered a large swarm on a tree limb near our apiary. I spent the late hours of the afternoon catching the swarm and installing it in a new hive. While I suspect this swarm came from one of our hives, I will inspect our apiary in the morning to see what I can determine.

I have maintained the practice of keeping a bee notebook for several years now. It has served as a valuable tool in keeping up with colony management practices and procedures. The notebook allows me to keep records regarding what was done to a particular colony of bees and when. Its documentation lets me know when the honey flow started last year and the year before. When did we add supers or harvest and extract honey last year? It is in my bee notebook. My bee notebook helps me to remember what was done to treat for *Varroa* or tracheal mites and when that was accomplished. With the passing of time, as you go back through and review the entries in your bee notebook, you can learn from your collected experiences, accomplishments and yes, even your mistakes.

Have you decided to try something different in your apiary? Write it down! Then, later on make a note as to whether that particular endeavor was successful or if you could possibly improve on a management practice in use. This could include the use of new equipment. For example, do you have some hives with solid bottom boards and some hives with screened bottom boards? Have you detected any differences between them? Make note!

The next section included in my bee notebook is a "Beekeeper Contact List." This consists of the names, addresses, phone numbers and email addresses of my beekeeping friends and associates. There have been occasions when I needed advice from fellow beekeepers regarding how to address a particular problem with a hive. Flipping though my bee notebook, I can get the contact information for the person who in my opinion may be best suited to give me the guidance I need. Some of the persons listed are members of our local beekeeping association. Others are persons that I met at state or regional beekeeping conferences. As I have developed beekeeping friendships over the years, I have added more and more names to my contact list. This beekeeper contact list has become very significant for me in maintaining these vital relationships.

Since I have my notebook with me in the field, if there's a situation I don't understand, something I need help with, or a sudden need for queens, equipment or food, I can call my local supplier and see if it's in stock. That way I save trips, and time.

Another section included in my bee notebook is called, "Package Bees, Queens & Nucs." This is where I list my suppliers of those items. For example, I have had the privilege of getting to know an experienced beekeeper that lives about 25 miles from me who raises good queens. For a time he was involved with the USDA doing research on developing mite resistance in bees. His home is off the beaten path, but his contact information and directions to his apiary are in my notebook. On occasion, when I have discovered a queenless hive, he has been a tremendous help. With just a phone call and a short drive, I have been able to secure a good replacement queen in just a few hours!

When ordering a package of bees from a supplier, I note whether the package was shipped as previously agreed or not. Was the package generous in quantity or

Write it down, right away.

lacking? Were transactions with the supplier conducted in a professional and courteous manner or were communications with them difficult? I make note!

When new beekeepers ask me, "Where do you get your bees?" I can refer to my bee notebook and share with them from my experiences. I now have a list of where to obtain queens, bees and nucs locally as well as a list of package and queen suppliers from out of state, who have consistently given me good service.

The last section in my bee notebook is for "Miscellaneous Notes and Information." In this section I have listed the bee supply companies that I use regularly and their contact information. When you call some of these companies it may be helpful to give them your customer number, so I keep it listed there too. This helps them locate you in their database and it may expedite your order. The person who prints the labels for my honey jars is also listed, along with the appropriate contact information. Also, in this section, I have a copy of our apiary registration number and contact information for the state apiarist. I even have a list of local plants, shrubs and trees that produce pollen and nectar for bees! When I acquire a leaflet or educational flyer relating to hive management, or how to treat diseases or pests, I put it in my notebook. As promotional materials are received about upcoming bee conferences, I put that information in the notebook. You get the idea!

I know there are those who do not like doing paperwork. But I want to encourage you to give the idea of creating and maintaining a bee notebook a try. More recently, I have kept my bee notes on the computer. I have a file in my word processor called, "Apiary Notes," that I update after visiting our beeyard. As pages of notes are added, I simply print them out and utilize a three-hole punch, so the pages can be clipped into my notebook. Of course, if you prefer not to type or use a computer, you can create a bee notebook using nothing more than a pen or pencil and manually document your activities on standard notebook paper. A bee notebook can be as simple or as elaborate as you wish to make it.

The practice of keeping a bee notebook may be especially helpful to new beekeepers. However, more experienced beekeepers may find it advantageous as well. Colony management records are very useful. Over time, it is often difficult to remember what you did to a particular hive several months ago. This is especially true if you have a number of hives to manage!

Having a bee notebook is a rewarding and productive endeavor. Over the years, my bee notebook has become one of my most prized beekeeping tools. It helps me to keep up with our apiary, provides information and insights to share with fellow beekeepers and contains resources for a number of important bee related topics. Indeed, the question asked by my friend long ago is still a valid one for beekeepers to consider. "Do you have a bee notebook?" BC

Fred Hembree keeps notes and bees at his home in Murfreesboro, Tennessee.

Let's Have A Picnic With The Bees

Ann Harman

A picnic with the bees, and beekeepers can be educational, entertaining and a Great Time, or not. Avoid the 'or not' part.

Let's have a July picnic with open hive demos! And we'll invite all our families. The kids can play games and also join us in the hives if they want. And it'll be a potluck with wonderful food! And Beekeeper Burt said we could have it at his place; he's got 10 hives. It'll be a great afternoon!

And so the East Cupcake Beekeepers Association planned their summer activity. It will be at a private home and all the beekeepers and their families are invited. Membership in the association is 73 but probably only about 45 will come. But with the families it's possible to have 100 or more at Beekeeper Burt's place.

Yes, it sounds like a great afternoon, but let's slow down and think this whole party through carefully so that it really becomes a great afternoon.

One of the first things to think about is your homeowner's insurance policy. It may very well cover everything you plan to do . . . or not. You know beekeepers are great people, but if something goes really wrong during the afternoon will that beekeeper still be a great person?

Let's start at the beginning – after you have found your insurance policy and have looked it over. By the way, is your insurance agent easily available to answer questions? You may have a few. Better ask now, not after a problem arises.

Asking a few club members to be helpers for the afternoon would be a good idea. You cannot be everywhere at the same time and having several dependable people assigned tasks can go a long way toward a smoothly-running picnic.

How about your dog? Some dogs are thrilled with a yard full of children and people. It's fun and games. Others just go all to pieces and nip. Your insurance company is going to ask why Ole Grumpy was allowed to be loose. Yes, he would not have caused trouble if he had spent the afternoon shut in a bedroom.

Here come the cars and pickups. Just where are 30 or 40 vehicles going to park? Think ahead. Someone may have to leave early and has asked not to be boxed in by other cars. Think about where to put that car. Now suppose that beekeeper did not think to ask. If a bunch of cars and trucks have to jockey around to let the car out you could have a fender bender. Actually that problem is probably handled between the drivers with dinged fenders. But suppose a couple of cars get stuck and slide around in that muddy, boggy place close to the board fence. Board fences don't move out of the way. Now you are involved in the dinged fender situation.

How abut making a big sign that says: "do not park in wet place." And put it by that boggy spot. Now the visitors have been warned not to drive into the mud and prevented by the big sign from getting stuck and sliding around. Having one of the volunteer helpers be a "parking attendant" will also make parking easier.

Since the picnic is a potluck, everyone will be arriving with food. Well, where does it go now? Where will it go when it's time to eat? Is there enough space in the house to accommodate the arriving food? One important thing to remember is some foods need to be refrigerated until the moment comes to serve and eat. Every Summer you hear about the unhappy people who ate the spoiled potato salad or other dish with mayonnaise. Beekeeper Burt needs to have room in his refrigerator to store perishable foods until time to eat.

Having a "food volunteer" or two will definitely help. They can arrange the food dishes, see that perishables are kept cold before serving time and any perishable leftovers removed from the serving tables promptly. You really don't want the next newsletter to report that 16 beekeepers got sick at the picnic.

Guess what. There're not enough tables for the food plus tables for people to sit down and eat. There're not enough chairs for everyone to sit down. Well, the kids can sit on the ground – they usually do anyway. In the picnic announcement did anyone emphasize the need for all to bring some chairs? In addition, if anyone had one of those wonderful plastic tables with folding legs, bring it! I certainly hope that those who brought food also brought suitable utensils to serve it. There's another reminder to put in the picnic announcement.

Oh, oh. The little grill

has been fired up for cooking hamburgers and hot dogs. The beekeeper doing the grilling is having a wonderful time talking about that really big swarm that got away. The kids are playing some version of Tag and running helter-skelter. The grillmaster went back inside for more "special, homemade sauce." Over goes the grill, hamburgers and hot dogs scatter – and so does hot charcoal. Two howling, burned kids. What does your homeowner's policy say about that situation? Oh, that hot charcoal didn't set off a grass fire, did it?

The situation seems to have calmed down so it's time to eat. The food has been set out buffet-style and everyone is encouraged to line up and pile your plates high! Sodas are in the coolers, help yourself. (See, someone remembered coolers and ice.) Now I would like you to think back just a few days when life was calm and quiet.

In late Summer, July, August, September, yellowjackets can be "picnic pests." Yellowjackets are meat-eaters, unlike honey bees. The yellowjackets love to bite off a bit of meat and carry it back to their nest to feed their young, the larvae. All this flying back and forth requires energy. So a sip of a soft drink is just what is needed. Unfortunately yellowjackets don't seem to realize that climbing down into a can of soda leads to problems. Have you noticed yellowjackets visiting your yard or patio while you are having supper or a snack outside? If so, you need to take precautions for your beekeeper guests.

The stage has been set for yellowjacket stings on tongue and in mouth and throat. The yellowjacket floating in the soda can is quite relieved to be rescued but will be highly annoyed when she finds herself in someone's mouth. Pour all sodas and sweet drinks into plastic cups so yellowjackets can be seen beforehand. Watch out for that yellowjacket on the chicken leg! Please warn everyone, especially children, about the quick, sneaky yellowjackets.

Not every food visitor will be a yellowjacket. Look at the dessert table. Since this is a beekeeper picnic, cakes, cookies and other sweets may well contain honey. It does not take long for honey bees to find a source. At least the beekeepers are used to having bees around. But family members might not be as pleased. Don't swat at the bees. Warn the children.

Now that everyone has finished eating it's time to clean up. Cans and bottles can be recycled. However the containers and trash bags for empty soda cans and bags for the chicken bones and other food scraps, along with plates, are also a banquet place for yellowjackets. Close and fasten them tightly and remove them to an area away from everyone.

Hey! Look! The chickens got loose and are running around a bit confused about all the people. Oh yes, there's the little kid inside the chicken pen with the pen door wide open. Children tend to be unsupervised at times and chickens do look like something to investigate. But roosters are not always the nice creatures found in children's books. Some roosters are nice but others can deliver a nasty gash. Your insurance company is sure to ask if the pen door was secured during the picnic.

Now that everything has calmed down, it time for the visit to the bees. Beekeepers love to go through beehives and here is a chance for Beekeeper Burt to show off his queens and honey. Sure, the kids can join in – they will all help to find the queen and to learn something.

Did the beekeepers bring their own veils? What about the kids? Do any of the kids own veils? Does Beekeeper Burt have extra veils? How many? Coveralls? Gloves? Are these bees nice and calm, quiet on the comb or do they object to being disturbed? Was this part of the picnic really thought through? So many questions.

When any visitors, even beekeepers, come to a beeyard, an Epipen® should be just as much part of equipment as veil, hive tool and smoker. By the way, check the expiration date on that kit. Is it one you bought unknown years ago? If so, you may need to get an up-to-date one before the picnic. The Epipen should have been present during the visits from yellowjackets.

Silly things happen in beeyards. You pick up a frame and in turning it to view the other side it slips and falls onto the topbars below. Unhappy bees. Unhappy beekeepers. Really unhappy children. Hives got bumped in the hasty retreat. More unhappy bees. Some else stuffed and lit the smoker and now it's quit. Somebody has a bee under the veil.

Planning the beeyard visit is probably the most important part of planning the picnic. Discuss your plans with your insurance agent. If you need to rearrange those plans, then do so. At least you will wake up tomorrow with a smile, and so will your beekeeping association visitors.

I am sorry you are feeling a bit depressed at this point. But so often we plan something that does not turn out to be as much fun as anticipated. I would really be happier if you had a good look at your insurance and ask questions of your agent before deciding to be the picnic host. Cheer up! You can have great picnics and fun beeyard visits with a bit of planning. BC

Ann Harman is preparing potato salad for her next picnic at her home in Flint Hill, Virginia.

Kerkhof Hives

Advantages Of A Two-Queen Set Up

Michael R. Harvey

Is it really that much better?

First off, what is a Kerkhof beehive? In a nutshell, a Kerkhof hive is a two queen hive with exceptional ventilation and walls that are somewhat insulating. Bees in a Kerkhof hive tend to produce more and tend to overwinter better.

History

The history of the Kerkhof hive is a little sketchy, at least to me. I first found out about them when I saw one in a friend's beeyard. He told me what it was and I decided I had to find out more. All I was able to find was the original patent – no other information whatsoever. So I'm relying on what I've been told by my friend who owns three, and the local dealer who has sold hundreds.

Herman Van De Kerkhof was granted Canadian patent #1055313 on May 29th, 1979. He produced the hives out of a factory in Vancouver, BC, Canada and sold them in Canada and the U.S. I haven't been able to tell if they were also sold in other countries. Locally, they were sold by Ed Weiss in Wilton, CT. Ed tells me he sold sometimes a hundred at a time to commercial guys. Clearly many beekeepers saw the tremendous benefits of this design. Unfortunately, Herman Van De Kirkhof's company went out of business about 10 or 15 years ago, right around the time the patent ran out. The Kerkhof hive has been unavailable since.

A Little More Detail

Essentially, this is an updated version of the Langstroth hive. It works on the same basic principals – boxes stacked on top of each other containing frames of comb. In fact, the same frames are used in a Kerkhof as are used in a Langstroth.

The bottom board is fairly simple. A large platform with two large openings and a ramp for the bees to more easily reach the frames. There are screened vents on the sides to provide ventilation when you have the main entrance closed. The two entrances face in opposite directions.

On top of the bottom board are two stacks of three brood chambers – six all together. On the front of these boxes is a small opening through which the workers can come and go. The two stacks face in opposite directions according to where the main entrances are. The outer walls of the boxes are double wall allowing for beespace between (I will explain the benefits of this later). The wall adjacent to the other stack is single wall. The two stacks of three boxes house essentially two separate colonies, each with its own queen. The frames in these boxes run lengthwise to the box and six regular Langstroth medium frames are used in each.

On top of these two stacks is a queen excluder, and above that the honey supers, which are double the size of the lower chambers and a single honey super covers both stacks. The frames in the supers run perpendicular to the frames in the lower boxes and again are standard mediums. This arrangement allows the workers from both hives access to the common super space, while keeping the queens in the lower boxes.

Now, at first thought you may think that letting both colonies into the same space would cause problems. Not so. It turns out the two coexist quite nicely. In fact, according to my friend who has three of these, the arrangement is typically a two-queen colony and they tend to produce more honey than two separate Langstroth colonies combined. The double wall arrangement in the lower boxes is continued in the supers.

Then comes the outer cover. That's right, no inner cover. Ventilation is built into the cover such that an inner cover is not needed.

So, what are the benefits of all this double queen, double wall, double stack stuff? Well, let's have a look . . .

Kerkhof Hive Benefits

Exceptional ventilation. The double wall arrangement combined with the bottom and cover vents provides exceptional ventilation throughout the hive. The small space between the walls creates a convection current much greater than that which would be created in the main hive area. In the Summer, especially on hot days, this convection current pulls the heat out of the hive. A cooler hive means the workers don't have to work as hard creating air flow, nor do they have to bring in as much water, which is normally needed to provide cooling. This means they can spend less time cooling the hive.

In the Winter, this convection carries moisture out of the hive. The air flow is necessary to remove the moisture but, if there is too much air flow past the bees themselves they end up having to work harder to keep the cluster warm. Eating up additional stores in the process. The convection current in a Kerkhof hive occurs primarily between the inner and outer walls thus keeping the bulk of the draft away from the bees. The cluster stays warmer while the humidity within the hive is reduced.

Lower humidity. Efficient ventilation means more moisture is carried out of the hive. Lower humidity in the Summer means the nectar and the honey cures faster. Lower humidity in the Winter means less chance of condensation on the ceiling and walls of the hive and thereby a healthier environment.

Warmer clusters. Obviously in any beehive, since they are only made of wood, there is heat loss through the walls. A Kerkhof hive is essentially two hives placed right next to each other. With this configuration, there is only heat loss through three walls instead of four, increasing retained heat for the cluster. Moreover, the air current between the walls is quite slow. So this space acts as a tiny amount of insulation also.

Every seasoned beekeeper knows that bees can take a lot of cold, as long as the humidity is low enough. But think about it. The warmer a cluster stays through the Winter, the less they have to eat to keep warm and the more stores are left over to get them going in the Spring. Anything we can do to help the cluster stay warm makes a difference in both their survival and their Spring performance.

Easier cluster movement. The main advantage of an eight-frame hive over a 10-frame hive is it means the cluster needs to do less horizontal movement to reach their Winter stores. It is fairly common in colder climates for a colony to die over the Winter with plenty of stores in the hive, simply because it was too cold for them to move horizontally to reach the food that was right beside them. The brood chambers in a Kerkhof hive are only six frames. This means a decent size cluster would require very little horizontal movement, if any. They only need to move up to reach their stores, which is much easier. The less they have to break cluster to reach their Winter stores, the better off they are.

Better honey production. There are several reasons for this. My friend thinks that the two colonies mingling in the super area sets up a competition between them and they work harder. This sounds a bit far fetched, but there are some logical reasons.

A cooler hive with lower humidity in the Summer means the workers can spend more time foraging and less time ventilating and hauling water to evaporate for cooling.

A warmer and dryer cluster in the Winter means more of the bees survive to Spring. The higher the population in the Spring, the more foraging they are able to do right off the bat. From there, you know how it works. Essentially, the higher the population in the Spring, the higher the population come honey flow time. The higher the population at honey flow time, the more honey you get.

The bottom line

With all this together, a Kerkhof hive outperforms a common Langstroth hive hands down. Better Winter survival and better honey production. Who wouldn't want that?

Now for the problem

Recall that the Kerkhof hives are no longer available. It's true that the Kerkhof factory has been closed for some time. And up to this point they have not been available. The good news is, an updated version is now being manufactured by a beekeeper in Brewster, NY. The new hives have all the features and benefits of the old hives, with "new and improved" added. There are enough new features that it has been given a new name. It's called the **Harvey Heritage Hive** – H^3 for short.

So, what's new?

The main difference is the bottom board. The original Kerkhof hives where built before we had the mite problem in this country. Therefore they didn't have a screened bottom board. The H^3 hives do. The new BB also includes better ventilation control and a built-in inspection board.

Better quality. While the old hives were very well constructed, they used particle board for the bottom board and inner walls. The new H^3 hives use exterior grade plywood for the inner walls. Plus, they have bigger handles. This is a relatively minor thing, but the easier the boxes are to handle, the happier you'll be.

You can check out the new H^3 hives at RusticElementBees.com. You'll be glad you did. BC

For more information you can reach Michael Harvey at mikeh@RusticElementArt.com.

BOOZE & BEES

The behavior of humans and honey bees are remarkably similar to, and thus are actually a good model for, human alcohol consumption.

Charles I. **Abramson**[1], Ibrahim **Cakmak**[2], Selvinar **Seven-Cakmak**[2], Michel B.C. **Sokolowski**[3], John M. **Hranitz**[4], Janko **Bozic**[5], and Harrington **Wells**[6]

Alcohol was one of man's earliest medical drugs, serving as an antiseptic and general anesthetic, and as such provided great benefit to humanity. Aside from medical uses, alcohol has been a social part of society. For example, ancient Egyptians brewed beer, and low alcohol English brown ale provided a source of safe drink before the waterworks of cities were designed to deliver clean water. Nevertheless one of society's greatest challenges is alcoholism. The latest data suggests that 10% of American adults report some type of drinking related problem linked to health, finances, and/or family interactions. Of driving related deaths, for example, 42% can be traced to drunk driving. The effect of alcohol on society is thus quite complex, and is an active area of research for psychologists and biologists as well as sociologists.

Although honey bees may seem unlikely subjects when you are interested in the drinking behavior of humans it turns out that they actually offer unique advantages as a model system for studying alcohol in society, and complement many vertebrate models on the subject. Moreover, in contrast to many vertebrate models for alcoholism such as fish and rodents, honey bees have a complex social structure, an ability to communicate, and exhibit a wide range of learned and unlearned behavior. Also, honey bees in contrast to vertebrates are relatively inexpensive to maintain. Areas of alcohol research with honey bees have focused on learning and behavior, social effects and metabolic processes.

Learning and Behavior

While the advantages of the honey bee as an animal alcohol model are impressive it did not prepare us for the astonishing results observed when we brought the honey bee into the laboratory for those first formal alcohol experiments in 1999. We expected a concentration dependent effect on learning and locomotion, and indeed observed this. In fact, bees fed 10% alcohol (just 10ul) were functionally incapacitated; they did not learn, could not move in a coordinated manner and did not return from foraging trips. However, much to our surprise honey bees readily consume both large volumes and high concentration of alcohol. At one sitting honey bees can consume the equivalent of 11 liters of wine for their size, will regularly consume 40 proof beverages and even drink 190 proof alcohol. Alcohol is readily consumed by bees in either sugar water, as in a mixed drink, or diluted with water alone. What we also found surprising in those early experiments was that switching a honey bee from a lower concentration of alcohol to a higher concentration did not slow the bee's drinking.

The emerging picture was thus that the behavior of humans and honey bees are remarkably similar to, and thus are actually a good model for, human alcohol consumption. Further experiments supported this conclusion. Honey bees, for example, actually have taste preferences among commercially available alcoholic beverages. Honey bees in our sample did not consume Old Charter Bourbon despite a sugar content of almost 15% but readily consumed various beers (*e.g.* Caribbean Twist Watermelon beer), wines (*e.g.* Boone's Farm Strawberry Hill), liqueurs (*e.g.* Amaretto), and schnapps (*e.g.* Dekuyper Buttershots). In general, honey bees prefer beverages that have low alcohol content and are sweet.

Many of our early experiments were performed with honey bees harnessed in tubes in which their response to tests was proboscis extension. The question also arised whether honey bees free to fly to a flower containing alcohol would do so, and in effect self-administer ethanol as do humans. Several of our experiments have shown that honey bees will repeatedly fly to an artificial flower patch containing nectar with alcohol and consume the reward. Alcohol concentrations below 5% in the nectar did not affect forager return rate to the flower patch, but

Bees in a harness. (Inscentinel Ltd. photo)

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"The honey bee offers researchers new possibilities to study drugs designed to ameliorate drinking behavior."

did influence their decisions: they became non-selective with respect to sugar content in alternative nectar rewards. Higher concentrations of alcohol resulted in foragers disappearing for hours, during when time they did not return to either the hive or flower patch.

Social Interactions

A unique aspect of honey bees as a model system is that they are social, which allowed us to test for emergent effects of alcohol in a social setting: effects that would not be observed when studying isolated individuals. In one of the more intriguing experiments we went to Brazil to study the effect of alcohol on hive defensive behavior in Africanized honey bees. Although we failed to find any change in occurrence of sting extension in harnessed Africanized honey bees following alcohol consumption, we observed a marked increase in aggression of Africanized bee colonies. Alcohol fed hives became so aggressive over such an extended period of time when exposed to a leather patch that the experiment had to be terminated. So the effect of alcohol is manifested when looking at a society but not when studying individuals!

In terms of functions within the hive, it was found that the waggle dance is erratic. In effect, the forager's motor coordination becomes "slurred" when consuming alcohol. After consuming 20% alcohol we noticed that the honey bees engaged in a tremble dance previously seen only following pesticide exposure. Cleaning behavior is also disrupted as is food exchange.

Metabolic Processes

The success of the behavior experiments suggested that it was also worthwhile to look at the physiology of the honey bee with respect to alcohol metabolism for similarities with humans. Our earliest attempts showed that the unpleasant effects of a physiological blockade of ethanol metabolism produced a learned aversion to ethanol consumption in honey bees as it can in humans. More recent experiments show that the metabolism of ethanol in honey bees shares temporal and dose-dependent responses in common with vertebrate models. Blood alcohol concentrations climb immediately following consumption, peak after 30 minutes, and remain elevated for more than four hours post-consumption. Blood alcohol concentration at 30 minutes also increases with the alcohol concentration of ingested solutions.

Especially exciting are some as yet unpublished results investigating possible cellular and molecular mechanisms related to how different doses of ethanol affect the stress response in honey bees. The cellular stress response is ubiquitous among animals for a wide variety of stresses. Stress proteins serve as molecular chaperones to protect cells from the harmful effects of protein denaturation under adverse conditions, including alcohol-induced oxidative stress. Stress proteins include six gene families of "heat shock" proteins (HSP), but chief among these is the 70-kD family of the heat shock proteins (HSP70). HSP70 participates in cellular and whole-organism stress resistance. We are finding that heat shock protein HSP70 concentrations show a dose-dependent relationship with ethanol consumption similar to vertebrate models. That is honey bees become increasingly stressed at low concentrations of alcohol to 5%. However, the stress response is not seen at a concentration higher than 5%. That the metabolic protection of normal brain function in the honey bee breaks down at 5% alcohol matches the behavioral data of learned impairment quite well.

Conclusions

Honey bees are ideal subjects for the study of alcohol induced behavior

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in humans; their responses to alcohol closely reflects that of humans. A behavioral catalog has been created with respect to the relation between alcohol consumption and bees. Also, a start has been made on examining the molecular processes associated with alcohol ingestion in the honey bee. Of particular significance is that alcohol produces effects at a honey bee's society level that are not predictable by observing responses of an isolated individual.

Questions, of course, still remain. For example, can honey bees become addicted to ethanol, and, is it possible to create a line of alcoholic bees? What can be said now is that the honey bee offers researchers new possibilities to study drugs designed to ameliorate drinking behavior. They also offer researchers a convenient animal in which to separate behavioral strategies of treatment from more cognitively based therapies. On that note, our current work continues to investigate the effect of alcohol on behavior and cellular processes at the University of Tulsa. Behavioral studies are being conducted in Turkey on the egg laying behavior of queens and the sperm production of drones when fed ethanol. An operant conditioning apparatus developed in France is now being used to look at the effect of alcohol on the pattern of reward in free-flying honey bees and how alcohol affects the ability of honey bees to judge time. A follow-up study on the influence of alcohol on communication in honey bees is currently being explored in Slovenia. A study on what genes are influenced by alcohol is also under way at Bloomsburg University of Pennsylvania. We hope to report the findings of these experiments soon.

As so often happens in science, our research was initiated by the chance observation of honey bees foraging on discarded wine bottles. We invite our readers to tell us any stories they have about boozing bees. Please address correspondence to Dr. Charles Abramson at the address below. BC

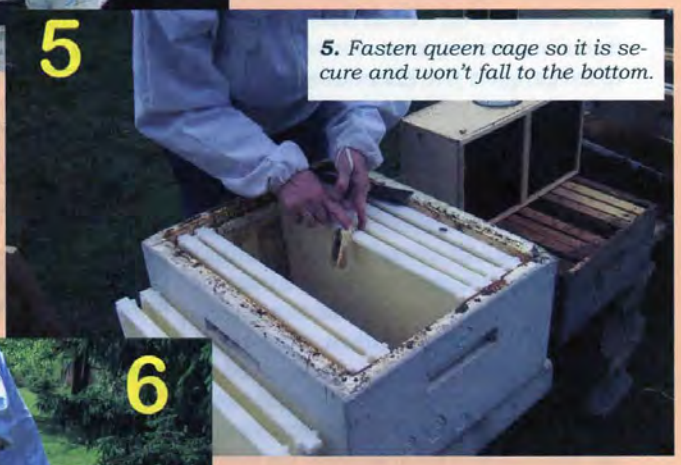
Address correspondence to: Dr. Charles I. Abramson, Oklahoma State University, Department of Psychology, 116 N. Murray, Stillwater, OK 74078.

1. *Get your bees as soon as they arrive.*

2. *With equipment ready, take the cover off the package, spray lightly with sugar syrup, gently slam package down so bees are dislodged and fall to the floor...not too hard.*

3. *Remove the feeder can, lift the queen cage out, and replace the can. Don't drop the cage.*

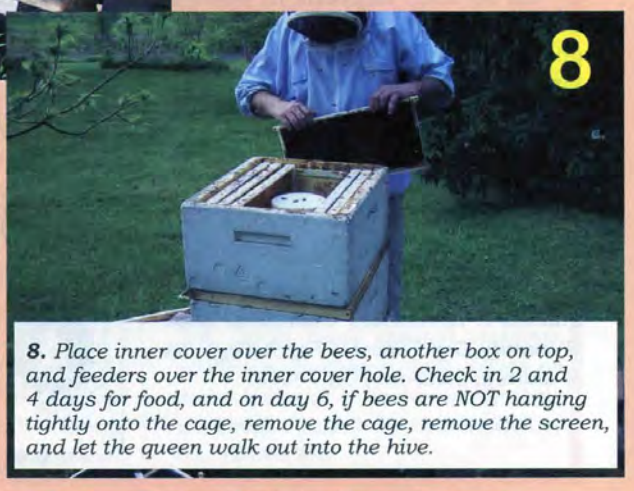
4. *Check queen to make sure she is OK, and put her in your pocket to keep warm.*



5. *Fasten queen cage so it is secure and won't fall to the bottom.*

6. *Spray again, remove can, gently dump bees into the empty spot left when the frames were removed.*

7. *Slowly replace frames, don't squash bees. Make sure the queen cage screen is exposed so the bees can feed the queen through the screen.*



8. *Place inner cover over the bees, another box on top, and feeders over the inner cover hole. Check in 2 and 4 days for food, and on day 6, if bees are NOT hanging tightly onto the cage, remove the cage, remove the screen, and let the queen walk out into the hive.*

PACKAGE PRIMER

GLEANINGS

APRIL, 2009 • ALL THE NEWS THAT FITS

CALIFORNIANS HONORED

The California State Beekeepers Association 2008 Convention was held November 11-13, 1008 at Harrah's Lake Tahoe. The convention was a great success that was well attended. It had exceptional speakers and a bustling exhibitors floor.

Lifetime Honorary Beekeeper Bill Koehnen

Young Beekeeper of the Year, Roger Everett

Presidents Award, Steve Park

New CSBA President Brock Ashurst

Beekeeper of the Year, Orin Johnson

HAYES WINS AIA AWARD

Jerry Hayes(left), Chief of the Apiary Section of the Florida Department of Agriculture and Consumer Services, is the recipient of the 2009 American Association of Professional Apiculturists Award of Excellence. In addition to managing a team of 14 apiary inspectors, he has administered $1.2 million in honey bee grants issued by the Florida Honey Bee Technical Council over the last four years. He has also facilitated numerous research projects in Florida with logistical and technical support. He is a strong advocate for basing decisions on research-based science, and his monthly column in the *American Bee Journal* is a fountain of good advice. He works tirelessly for beekeepers, and his public relations skills are exemplary. In addition to running an excellent program in Florida and having a major influence on beekeeping nationwide, Jerry has made important contributions to international apicultural by contributing his time and expertise to apicultural development in Nepal, Guyana and Ukraine. The award was presented by Marion Ellis (right) at a joint meeting of the American Association of Professional Apiculturists, the Apiary Inspectors of America and the American Bee Research Conference in Gainesville, Florida on February 3-6, 2009.

RURAL BOUNTY

RuralBounty.com is a new and powerful one-source directory to assist the public in locating farm fresh fruits, vegetables, honey, activities, entertainment, attractions, and family events and festivals.

The directory was designed and developed by Jane Eckert of Eckert AgriMarketing, one of the leading Agritourism experts in North America, and a sixth generation farmer's daughter. "In RuralBounty.com, we have designed a website where consumers can quickly and easily search for a specific farm, or for any farm in a specific geographic area," Eckert said. "Rural Bounty allows them to choose a state, province, city, a zip code, a particular berry or fruit, or even a special activity such as a wagon ride or pick your own experience. The consumer selects the search parameters he wants, and our dynamic search engines help them locate exactly what they are looking for in just a matter of seconds."

Membership listings in the mega-website are just $45 annually for a basic membership or $125 for a premier membership. Each member has a full web page listing, along with a description of their business plus an extensive listing of their products and services. Members may update their information online at any time.

"Each new member has an opportunity to select from more than 500 products, activities and services that describe their business," said Eckert. "Our premier members will also be able to add additional descriptions and photographs to illustrate their page." Every member's page will provide their address, phone number, email address, and a link to their website, if they have one. If not, this will give them a web presence."

As a new entity on the web, RuralBounty.com is also making a substantial investment in promoting the new site, including very specific geo-targeted adwords based on the demographics on its membership as well as targeted publicity.

Sign up online, at www.ruralbounty.com. For information, visit www.ruralbounty.com, info@ruralbounty.com, or Jane Eckert, 314.862.6288.

UK - Plan To Protect Honey Bees – The British and Welsh governments published a £4.3-million ($5.94-million), 10-year plan to protect and improve the health of honey bees in England and Wales.

The plan was drafted in consultation with beekeeping organizations and aims to sustain honey bee populations by supporting beekeepers to ensure effective biosecurity measures are adopted to minimize risk from pests and disease.

Some £2 million ($2.76 million) will be spent over five years on a new research programme on pollinators now being developed with other funding partners.

The first stage of the plan will attempt to identify and make contact with perhaps as many as 20,000 amateur beekeepers to make sure that they are aware of the need to alert the National Bee Unit (NBU) to bee health problems and encourage them to register on BeeBase, its beekeepers database. This will help ensure any new or existing health problems are identified.

Registration with BeeBase is free and provides the beekeeper with a free visit from their local bee inspector and access to a wide range of information on their craft.

The Department of Environment, Food and Rural Affairs says the last two years have seen recorded losses of between 10% and 15% in bee numbers although it is possible real losses are significantly higher due to the number of beekeepers not in contact with the NBU.

The plan describes the five main goals:

•To keep pests, diseases and other hazards to the lowest levels achievable.

•To promote good standards of husbandry to minimize pest and disease risks and contribute to sustaining honey bee populations - prevention is better than cure.

•To encourage effective biosecurity to minimize risk from pests, diseases and undesirable species.

•To ensure that sound science underpins bee health policy and its implementation.

•To get everyone to work together on bee health.

The plan also identifies the distinct roles and responsibilities of government, beekeepers, their associations and other stakeholders in achieving these aims. A strengthened partnership, involving all interested parties, is essential if current and evolving threats to bee health are to be successfully identified and addressed.

The value of UK commercial crops from pollination is estimated at £100 million to £200 million ($138.2 million to $275.4 million) a year.

The main threat to British bees is the Varroa mite.

The UK's only Professor of Apiculture, Francis Ratnieks of Sussex University, tells The Telegraph newspaper the new strategy risks overlooking obvious problems.

"Better bee husbandry and greater inspection are part of the solution," he says. "But investment in research is needed to control *Varroa* mites - the UK's biggest honeybee killer.

"Hive inspections are not relevant to the *Varroa* problem as all hives have it already, and without research how do we know how to control this pest?"

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Brazil - Record Year –The Brazilian beekeeping industry reports a record year in 2008 as exports rose 42% to 18,270 tons from 12,900 tons in 2007 and sales doubled to US$43.57 million from US$21.2 million.

The industry is the 11th largest global honey producer and ninth largest exporter.

Brazzil magazine reports the average price of US$2.83 a kilogram (US$1.28 a pound) received for export honey was a record for Brazilian exports, up from US$ 1.64 a kg paid in 2007 and beating the US$2.63 figure set in 2003.

The U.S. was the main destination for Brazilian honey, accounting for 73.1% of total exports for US$ 31.84 million at an average price of US$2.32 a kilogram. That was up from US$1.64 a kilogram in 2007 and broke the record of US$2.36 a kg set in 2003.

Germany accounted for 16.5% of exports at an average price of US$ 2.66 a kilogram, while Canada took 5.3% of sales at US$2.308 million) with an average price of US$2.57 a kilogram.

The end of a European embargo on Brazilian honey in March saw the industry implement Good Practices and the Hazard Analysis and Critical Control Points (HACCP) at depots and honey stores. It also began meeting registration requirements with the Brazilian Ministry of Agriculture, Livestock and Supply.

"It is worth noting exports to the European Union would increase, if only there were more depots accredited with the Ministry of Agriculture for exporting honey to Europe, as that market purchased good quantities and paid better prices," Sustainable Integrated Beekeeping Network (Rede Apis) national coordinator Reginaldo Resende tells the magazine.

GLOBAL WR

Costa Rica - Forgotten Pollinators Found And They're Not Pollinating – To find out the cause of what's being called a global pollination crisis, researchers at Oregon State University have successfully attached an electronic tracking device to a hummingbird for the first time – and the darting travels of the tiny bird may be pointing the way to at least part of the problem.

In the tropical forests of Costa Rica, this green hermit hummingbird, which is an important pollinator of some forest plants, in essence refused to visit isolated sites and traveled only in narrow corridors of the remaining forest – even if this meant taking the roundabout way back home.

This supports the theory that fragmentation and disturbance of landscapes may indeed be a significant contributor to pollination problems that are plaguing plants around the world, researchers say.

The findings will be published soon in Biology Letters, a professional journal.

"It's been widely observed in many studies that we're seeing a global decline in both pollinators and plant diversity, to the point that many ecologists are calling it a crisis," says Matthew Betts, an OSU assistant professor of forest ecosystems and society. "It's less clear exactly what is causing this. But it's a serious concern, since 70% to 80% of all plants are pollinated by animals."

Most of those pollinators, the researchers said, are insects – but it's not practical to put electronic trackers on the back of a bee. So the OSU scientists moved up to a slightly larger pollinator that was just barely big enough to handle a transmitter – a hummingbird.

With recent advances in the miniaturization of tracking devices and a little non-toxic eyelash glue on the bird's lower back, they were able to attach an electronic tracker for about two weeks to green hermit hummingbirds that live in tropical forests.

"These birds fly very quickly and in theory they could move easily through open spaces," said Adam Hadley, a doctoral student at OSU. "But we found they chose to stick closely to areas with forest cover and take the long route back home, possibly to stay close to food or in fear of predation."

The birds would move along corridors that connected larger patches of forest, the research found, but would not go through open areas to visit isolated fragments. With no pollination of their plants, the researchers said, it's likely that plant diversity in these separated fragments will ultimately decline. The study supports the importance of remnant forest strips and riparian buffers that connect separated forest fragments in heavily managed landscapes.

What was observed in this case with a bird in a tropical setting, the scientists said, cannot immediately be extrapolated to what insects or other pollinators would do in a temperate zone.

"This does not prove what other animal pollinators would do in similar circumstances," Betts said. "However, most animals need or prefer a connectivity of the resources they depend on. This does support the concept that landscape fragmentation is restricting the movement of pollinators, and that may be a part of our pollination problem.

"If we get to the point where almost all patches of forests are fragmented, it's possible that could completely disrupt forest plant ecosystems," he said.

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Fiji - Flooding – Fijian beekeepers have been asked not to harvest honey over the next two months after the South Pacific island group was hit by deadly floods.

Initial estimates are that more than 200 hives were destroyed in the flooding.

"More than 200 beehives have been destroyed and more figures are yet to come," national agricultural coordinator Kamal Prasad says.

The floods have killed 12 people, forced 10,500 people to be evacuated and devastated the economy of a country already hurting economically after a military coup at the end of 2006.

Agricultural officers have not been able to reach some areas due to road blocks and flooding.

Kamal says harvesting honey from the surviving hives after the floods will leave no food for the bees. He says the bees need honey at this stage for the maintenance of the colonies and farmers should also top up their hives with dry sugar feedings.

He predicts there will be big drop in honey production this year as most bees are dead and floral vegetation has been badly disturbed.

"Last year, we produced around 700 tonnes of honey but this year due to flooding and strong winds it is expected that there will be a shortfall of more than 100 tonnes," he tells the Fiji Times newspaper.

He says beekeepers should also ensure their surviving beehives are safe from the extensive flooding and strong winds.

P UP – *by Alan Harman*

Britain - Finding Home Decisions – Honey bee swarms send out scout bees to assess the quality of a potential site for a hive and the swarm comes to a group decision on a new site based on the scout's reports, new research has found.

The scouts describe the sites they find by doing a dance and the swarm makes its decision by revisiting the recommended sites until a consensus emerges and all the bees are on the same dance page.

Christian List, Professor of Political Science and Philosophy at The London School of Economics, along with Christian Elsholtz, a mathematician at Royal Holloway University of London, and Thomas Seeley, a biologist at Cornell University, published their findings in the journal Philosophical Transactions of the Royal Society B.

The research shows that a swarm's remarkable reliability in picking the best site stems from a sophisticated interplay of individual and collective decision-making amongst the bees.

Scientists already know that when a swarm is looking for a new home a few hundred scout bees fly out to randomly explore potential nest sites. They then come back and perform a 'waggle' dance, with the duration of the dance indicating the quality rating they give to the site.

Initially the scouts visit and inspect sites by chance, but once the dancing activity has built up, they are more likely to visit and inspect sites advertised by others. Eventually dance activity tends to converge and a consensus emerges. Biologists have observed that the bees reliably find a high-quality nest site.

On average, a honeybee swarm contains 12,000 bees. A typical decision making process takes about two days.

The researchers developed a computer model by which they could simulate the bees' decision making process in order to look at its individual components and work out why it is so accurate.

"We found that it is the interplay of independence and interdependence between the bees that is so crucial to making a quick and good decision," says List, who works on social choice theory and mathematical models of decision making.

The model shows if the bees act solely independently, finding nesting sites but not advertising them, it slows the process down dramatically. Relying on the 'cosmic accident' of all the bees eventually stumbling on the same best site leaves the swarm homeless and vulnerable.

On the other hand if the bees act overly interdependently – blindly following the recommendations of other bees without checking the sites out for themselves – a consensus decision is rapidly made but there is no guarantee that it will be the best, or even a good decision.

"The honey bees' decision procedure is remarkably sophisticated," List says. "The swarm manages to block and prevent the kind of 'group think' that can bedevil good decision making.

"Humans, for example, demonstrate this kind of bad decision making behavior when a number of investors, through random accident, buy stock in a company and others rapidly join in with the crowd, thinking that the increased demand for the stock indicates something real. This can result in a market bubble, where the price of the stock goes through the roof for no good reason and often with bad consequences.

"Looking at decision making processes in both humans and animals is very important. The need for collective decision making occurs almost everywhere in complex societies, and a good fundamental understanding of these processes can help design human organizations in ways that encourage good decision making."

Australia - Prices Up, Supply Down – A trilogy of natural disasters is likely to send Australian honey prices soaring.

Capilano Honey Ltd., the country's biggest honey producer, blames massive flooding in Queensland, drought in New South Wales and deadly wild fires in Victoria for destroying bee production and cutting supply.

Managing director Roger Masters tells the Melbourne Age newspaper honey supply in Australia would be jeopardized by poor weather, with wholesale honey prices already up 12% in a week.

This after beekeepers saw an 11.4% rise to A$3.02 a kilogram in the first half of 2008-09.

"There is no doubt we will see those prices being passed to consumers, as is the same with other products like fruit and vegetables; a lot of these crops have been hit pretty hard," Masters is quoted as saying.

Domestic sales for Capilano's honey products were hit by the loss of its private label business with the Coles supermarket chain because drought conditions in south and south-eastern Australia meant the company could not guarantee supply.

Masters says Capilano is working to absorb rising honey prices after a 23% increase since the July beginning of its financial year.

"Some of those fluctuations we absorb, but it's pretty difficult when we have got bee-keepers out there who are themselves struggling with droughts, fires or floods and we have to try to make sure they do get reasonable returns for their honey," he says.

Masters also says Capilano is winning a greater share of the North American market and had recently won access to a leading supermarket chain in America while becoming an established brand on the eastern seaboard of Canada.

"We are competing against cheaper Chinese honey in markets like the Middle East, but in places like Canada you are really competing against Canadian honey," he says. "In the U.S. people do look for Australian honey, because they see it as something new, something clean."

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U.S. - Food Safety. Job #1 – The seemingly constant stream of food safety recalls has 23% of Americans saying they will change their long term food buying behaviour.

A study of U.S. consumer attitudes by public relations and communications firm Burson-Marsteller and polling company Penn Schoen & Berland Associates also found 68% of Americans believe the instances of food contamination have increased in the past five years.

Some 87% continue to believe the U.S. has one of the strongest food safety systems in the world, but only 28% strongly agreed with this.

Burson-Marsteller says the study found companies with strong brand awareness are more likely to withstand an incident of food contamination than less well known companies. An incident of contamination at a familiar company is more likely to be judged as an isolated event than a similar incident at a lesser known food company

Just 11% strongly agree food processors and manufacturers are well prepared to deal with food contamination outbreaks, while 58% somewhat agreed, 27% somewhat disagreed and 4% strongly disagreed.

Burson-Marsteller managing director Bill Zucker says the study clearly shows the need for food manufacturers and producers to be prepared to address them quickly and openly.

"While most food producers take significant measures every day to protect our food, this should serve as a wakeup call to companies," he says.

They survey also finds 65% of consumers say during a food contamination outbreak, they change their short term food buying habits, but not long term behavior. However 23% of consumers and 27% of mothers say the recent massive recall involving products with peanut ingredients will change their long term food purchasing habits.

More than 30% of consumers believe food processors are to blame for a recent series of food contamination issues and 25% blame regulators.

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Japan - Theft, Common. Price . . . Wow! – A shortage of bees in Japan is leading to crime, something previously rare in the country's apiary industry.

Police report a beehive containing up to 50,000 honeybees was stolen from an apiary in Tokyo's Setagaya ward.

The 73-year-old beekeeper reported the hive was one of 10 he owned.

Police believe someone in the industry committed the crime.

The hive was almost ready to harvest.

"We're upset because we were planning to collect the honey after the cherry blossom season in April," a member of the beekeeper's family tells reporters.

The shortage of honeybees this year has seen the price of a box of about 30,000 honeybees rise to 60,000 yen ($620).

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Getting It Wrong

Ed Colby

When the world was young, my ski patrol buddy Kern would say that patrolling was "like getting paid to eat ice cream."

Forty years later, it's more like "getting paid to eat honey," at least for me. I provide honey for the two Aspen Mountain patrol stations. I just keep track of how many quarts we go through and send the company a bill at the end of the season. I know times are tough, even in gilded Aspen, but so far nobody's squawked.

And I'm my own best customer! I encourage my co-workers to eat my honey, and they do, but nobody eats as much as I do. I figure every time I put a healthy dollop in my tea, it's a quarter in my own pocket.

One patroller is a notorious cheapskate who has never bought honey from me, but he's the runner-up at eating honey on the job. That's O.K. If I can't get him one way, I'll get him another.

My problem is that I'm a better salesman than I am a beekeeper. Whatever I produce I can sell, and I usually wind up having to buy extra honey from Paul to satisfy customer demand.

I thought I might increase honey production by beefing up my bees, so in February I ordered MegaBee pollen substitute from Dadant. I'm equidistant from the Fresno, California and Paris, Texas outlets, so I can go either way. If it's late in the day, I'll call California, because they're an hour earlier than Colorado.

This time in my haste I mistakenly called the Chico, California, branch instead of Fresno, and it took me a while to figure this out. But "John" said he had product and told me he could ship that afternoon. On the Dadant map Chico is only a quarter of an inch farther from my house than Fresno. What's a few extra bucks shipping when the man says he can get it out today?

The timing was critical because I wanted to feed my bees on the following Monday or Tuesday – my next days off. If the MegaBee arrived too late, it would set me back a week at a critical time.

This might sound like "just-in-time" ordering but the reality is that I am simply a poor planner.

I have a sweet deal on a cozy Aspen bungalow, so I rarely drive the 55 miles to come home during my work week. But I have a rental unit on my property, and I asked my reliable tenant Gary to keep an eye out for my MegaBee and put it in the garage when it arrived.

I should say my normally reliable tenant Gary. A day later he called me in Aspen to say he was leaving for Montana. Something about a girl.

Gary collects the eggs and takes care of my Rhode Island Reds when I'm in Aspen, so I needed a chicken sitter who'd also watch for those MegaBee boxes.

I called my good neighbor Chuck. He's an experienced chicken sitter, but he's got a few years on me, and I didn't want him lifting any heavy boxes. He said he's throw a tarp over them if the weather looked inclement. I figured everything was taken care of.

But Sunday evening when I got home, there was no sign of the MegaBee. What?! I looked on the porch. I looked in the garage. I looked in the house. Now what? It wasn't going to arrive the next day – Monday – because that was Presidents' Day, and if it came on Tuesday, it might be too late. Wednesday I had to be back on the job. I'd have pulled my hair, if I had any. I thought about putting in for an emergency personal day on Wednesday, assuming my shipment arrived on Tuesday.

Just as I reached for the phone to call Chuck, I decided to check my messages. The first one was Chuck's. He'd put the MegaBee in the cab of my pickup.

You see? You jump to conclusions, you assume things, and you're generally wrong.

As for gossip, never believe a word of it. At the Colorado beekeepers convention in December, I struck up a conversation with a beekeeper I barely know. He said, "Don So-and-so from Palisade sells fruit in Boulder, and last Summer he said your bees aren't any good. He asked me if I'd rent him mine." The beekeeper was pretty matter of fact, and I believe just about anything anybody tells me with a straight face.

What was Don's problem? He seemed like the nicest guy – retired minister living his peachy dream. I knew that two years before, I'd gotten him his bees a little late, but that was his scheduling error, not mine. And I always gave him good bees. I hated the thought of losing this rental, only partly because Don's orchard floor turns to pure dandelions, and my little darlings come back spilling out of the supers.

I didn't want to corner Don, so I sent him an e-mail. I said "a little bird" told me he wasn't happy. "Who told you that? Your bees are just fine," he wrote back.

Maybe my beekeeper acquaintance had his Summers mixed up. Maybe it was the Summer before, after my bees arrived late, that he talked to Don. Maybe Don had a change of heart. I'll likely never know.

But I re-learned two old lessons, at least: Be wary of idle chatter – and never assume – because there's a 95 percent chance you're 100 percent wrong.

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