2003 Honey Stats . . . 11
2 Queen Colonies . . . 31
Global Warming & Beekeeping . . . 35
American Holly Honey . . . 63

Bee Culture

APR 2004

ROOT™
PUBLICATIONS
Catch The Buzz
www.beeculture.com

Maryann Frazier, Penn State Extension Specialist in Apiculture took this photo of a honey bee on a raspberry flower. Pennsylvania hosts this year's annual EAS Conference from August 9-13, 2004, at 7 Springs Resort in Champion, PA. For details on the program, schedule, short course, speakers and more, see pages 28 and 42. Check out our web page at www.easternapiculture.org for additional information.

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

APRIL 2004 VOLUME 132 NUMBER 4

FEATURES

800.289.7668 • www.BeeCulture.com

Publisher John Root

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

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

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

Contributors

Steve Sheppard • Mark Winston • Clarence Collison

Ann Harman • James E. Tew

Malcolm T. Sanford •

Subscription Information

U.S., one year, $21.50; two years, $41. Newsstand price: $3.50. All other countries, (U.S. Currency only), $15.00 per year additional for postage. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), April 2004, Volume 132, Issue 4, is published monthly by The Root Candle Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Advertising

For information on placing display advertisements, contact Dawn Feagan in our Advertising Dept. 800.289.7668. Ext. 3220

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

DEPARTMENTS & COLUMNS

KEEP IN TOUCH

Write: Editor, 623 W. Liberty St., Medina, OH 44256
FAX: 330-725-5624
EMAIL: KIM@BEECULTURE.COM

MAILBOX

Electric Trailer

This is a picture of my bear-proof bee trailer The hive body you see under the trailer has a 12 volt battery and fencer attached so the entire body of the trailer is electrified.

Edward Kuehl
Embarrass, MN

Commercial & Non

Keep your magazine as is. It has articles of importance and interest to all beekeepers. By dividing people it makes it easier for the 'big' organizations to control all activity. I thought John Miller's characterization of 'our retarded little industry' being consumed by bickering and fighting between the 'two mental midget "national" organizations' on target. We need to cooperate to help the whole industry, large or small, support our healthy food supply.

Jim Lyons
Bellingham, WA

Painting Made Easy

Here is a tip on how to quickly paint bee boxes. I have a 1" pipe (Galv.) 20' long, with three support ropes to hold the pipe chest high. I am right handed so all the frame rests are on my right. First I use a small brush (2') to paint the hand holds and frame rests, turning the box as I paint. Next I use a roller to paint the sides and top and bottom. It does not take long (2 or 3 minutes each box). I do not try to stretch the paint. It may drip or run but the bees do not mind. Let the boxes dry on the pipe. Next day put on more boxes and paint.

George Dupeire
Baker, LA

Botulism and Honey?

I really enjoy your *Bee Culture* and especially how it has really gotten better over the years. There is one subject that has bothered me for a long time that I would like to see a full length, in depth article on looking at infants to one-year-old children and honey (the botulism controversy). I remember the reason this was started but I never heard how deep the honey industry really investigated the issue. I don't like what happened anymore than anyone else but I know other foods have caused a lot more problems and you don't see them put labels on theirs. Do a lot of people misunderstand this label?

Has this hurt the honey industry? Do some adults not eat honey because of this? Has this hut the image of honey? What do other food companies do? What can we do to honey to correct this? I feel there are a lot of people that don't understand the depth of this and its time it has had some new study done and especially make it clear for the producer.

These are real issues that deserve some time and study.

Dale Wolf
Baldwin, WI

Would A Woodchuck?

I could feel for Jim Tew's Winter feeding problems. I think it's a good article, but I wonder what makes him think the animal was a woodchuck that was harassing his hives? Did he see it? I have never before heard of that animal doing anything of the sort, but it is common knowledge that other animals, including skunks, will move into a woodchuck's burrow during the Winter while Mr Chuck is fast asleep. Is there any reason to believe that wasn't the case this time?

Melvin Yoder
Delano, TN

No To Frankenbees!

In a move announced recently, geneticists, working without the approval of any national beekeeping organization, have stated their intentions to use the mapping of the honey bee's genes to splice in a moth's gene which is resistant to organophosphates, thereby rendering the bees pesticide resistant to those chemicals. This is curious on several levels. Writer Tom Theobald called it an extension of splicing resistance to herbicides into plants. As Tom Theobald puts it, "What's next, engineering human genes for tolerance to pesticides and herbicides?" Can't you imagine next this comment to fly across the dinner table, "Honey, pass the

Continued on Next Page

MAILBOX

salt and malathion."

There are a couple of things in the gene splicing arena of which beekeepers might approve. For ages farmers have selected for genes which promote desired traits such as productivity and disease resistance.

Using the genome research to make it possible to use more chemicals with impunity is gross misuse of knowledge and is opposed by the American Honey Producers Association. The fault lies not with the marvelously constructed honey bee. Rather, I think, it is with the greedy and arrogant chemical companies who would support research that could more properly be used to move toward a more natural state of bee-ing and away from, not closer to, Frankenbees.

Paul Hendricks
Englewood, CO

Inner Cover Rebuttal

In the Inner Cover column of the Feb 2004 *Bee Culture* there are several issues I must argue. First is the issue of who will pay for Big Brother's oversight and/or bad publicity fall out. You suggest the final packer will pay. While the final packer may see reduced gross revenues his profit margin will remain largely the same. Historically when the costs of bureaucratic administration have increased these costs have been borne by the producer, not the packer, the distributor nor the grocery store. Profit margins for all but the producers remain the same. I was raised in the dairy industry and have witnessed this all too many times over the years. BSE (mad cow) is a prime example. The largest decrease in prices is on the producer end of the equation. While some slaughter houses may lose some money recalling product, that loss will be quickly made up in lower prices paid the farmer Even on the issue of economic loss the farmer/ producer will always pay first, and always pay the most.

While purity is indeed an issue it is not the issue with Smuckers et al. The issue is money. They wanted cheap honey, they found someone to provide cheap honey and they received cheap honey. They attempted a tactic that most of corporate America attempts from time to time—compromising quality in favor of profits—sometimes this works, sometimes it doesn't. If Smuckers, and their supplier's, problem turned into a "P.R. nightmare" they brought it upon themselves. Unfortunately this goes back to "who pays?" as well. Ultimately it will be the domestic producer, particularly the sideliners and smaller professionals, who will pay for the bad publicity caused by cheap, imported, contaminated honey.

Third is the issue of food supply line conglomeration. Yes, fortunately, this is a fact of life. Fortunate because of the ever increasing population of Americans that insists on knowing where their food is grown. Fortunate for those of us who see an opportunity to provide for these people. We sell from farm stands, farmers markets and from home. Yes, the time we spend selling a pound of honey is significantly more than the big packers, our customers demand it, so do we. They want to know they can trust us, we want that too. We educate our customers on the importance of honey purity, honey house sanitation and the importance of our bees both economically and environmentally. We wouldn't supply Sam's Club if for no other reason than we wouldn't lower our standards that far. The big packers and importers may run the industry but it is us little and medium sized guys, who are their best salesmen.

Tim Bueler
Snohomish, WA

Success!

I noted in many of the correspondence and honey reports about the tough year many have had getting surplus honey. I thought I would share with you a (photo) sample of our successes here at Harecrest Acres.

Due to high market prices and our largest harvest ever, I am proud to say this was one of our best years on the farm! We owe it in part to all the helpful advice from your publication.

Note (in the photo below) the hang tags we developed. One side has our logo and product name and the back has source and contact information. We found this to be a great solution to labeling the variety of containers we used as it is a standard template that can go on any size or shape container. Just fill in the price and size and put it on the shelf. Best of all they are extremely inexpensive to have made at a local print shop or on a color printer

Matt Haas
Biddeford, ME

Good Mead Is Easy

It's always a pleasure to read a good mead article, and Mark Winston's description of the setting and scenarios for two truly excellent meads in the February '04 article titled "Two Bottles of Mead," was one of them. I have to say, however, that I was taken a little aback by his statements that these experiences are unfortunate rarities, and that all too often meads, both homemade and commercially produced, are of poor quality. According to the article: "Mead can be pretty difficult to quaff, whether store-bought or homemade. It is simply not that easy to produce a superior honey wine."

Someone needs to quit foisting these bad meads on Mark and introduce him to more experiences like the two he wrote about!

In all seriousness, without disputing any of Mark Winston's experiences (I've had a few bad meads myself), good meads are not difficult to make.

One of my own prize winning meads was fermented in nothing more than a simple four liter wine

MAILBOX

jug. It can be done!

At one time mead did have an uncertain and widely accepted reputation which was not altogether different from Mark Winston's encounters, however, this was several decades ago. A lot has changed since then. Although there are still bad meads to be found, interest in meadmaking has picked up considerably, with a lot more meadmakers turning out good to excellent meads. The meadery industry in the U.S. is up to nearly 70 meaderies listed on Internet directories, with an annual conference, The International Mead Festival (www.meadfest.com) meeting for the third year November 2004. It is now a $15 million to $20 million industry. Commercial meadmakers have been entering their meads in national level wine competitions and coming away with gold, silver and bronze medals. This is not an isolated market for people with select palates.

It's difficult to say where it started, but there's no doubt that the meadmaking scene has made a number of significant advances. The home brewing movement, beginning in the late 1970s and spearheaded by American Home brewing Association founder Charlie Papazian, played an important role.

Charlie has made no secret of his fondness for mead and has been an enthusiastic promoter. The late Roger Morse of the University of Cornell laid the foundations for improved understanding of honey fermentation with his research in the 1950s and 1960s, eventually patenting a method for the commercial production of mead with his colleague Keith Steinkraus. The late Robert Kime, also of the University of Cornell, adapted ultrafiltration to mead production, resulting in meads with an especially clean flavor profile and improved fermentation times. With Kime's generous assistance, many meaderies began using ultrafiltration in their production lines. Ken Schramm has published a new book on meadmaking, *The Compleat Meadmaker*, (available from *Bee Culture's* Book Store) updating information found in the older books and recipes which, unfortunately, at times was flawed and misinformed. The Internet has also been a site of activity for the swapping of meadmaking ideas and techniques.

Vickie Rowe's web site, www.gotmead.com, is one of the best, and there are excellent discussion groups such as the Mead Lovers Digest (www.talisman.com) and the USENET newsgroup rec.crafts.meadmaking.

I had the pleasure of making Ken Schramm's acquaintance at the first meeting of the International Mead Festival, held in Chicago in the Fall of 2002, and have maintained correspondence via e-mail. Ken has been very involved with meadmaking since he first started a number of years ago.

Along with his recent book publication, he has co-authored several articles on meadmaking with Daniel McConnell and co-founded the Mazer Cup competition, now the Bill Pfeiffer Memorial Mazer Cup, the first national level all mead competition and one which has maintained some very high standards for judging. Ken is not a bad hand at meadmaking himself. When he tells me he has meads in his cellar "that'll knock your socks off," I believe him. I took the opportunity recently to ask what he thought had helped make the change in mead quality, from the infamous strained fermentations lasting up to a year, to enjoyable beverages finishing out in four weeks or less. "Nutrients are the killer," was Ken's immediate response, then he added that ensuring a healthy fermentation is the key to successful meadmaking. So many of the older methods were suspect, he pointed out, adding acid at the start of the fermentation and causing excessive pH drops, for instance, or not taking care that the yeasts had sufficient nutrients.

Ken also pointed out that the increased exchange of knowledge has also been a major factor. More and more good meadmakers have been sharing their knowledge and expertise with others, resulting in better meadmaking.

Meadmakers are also giving more attention to the uniqueness of honey, its biochemical properties and affects on fermentation and how to best preserve honey flavor and aroma. In *The Compleat Meadmaker*, Ken details an approach to preparing the honeymust which takes advantage of the natural antiseptic properties of honey, avoiding the use of heat for pasteurization and thus better preserving the floral aroma and flavor of the honey in the finished mead. He also covers varietal honeys, honey analysis and beekeeping in the book. Another example, Illinois meadmaker and beekeeper Chuck Wettergreen casts aside the conventional wisdom of the use of additives to control the fermentation and simply uses honey, water and yeast alone. He has worked a great deal with honey blends, preferring to rely solely on the natural qualities of different honeys to best aid and nurture the fermentation along. His meads are of a consistently high quality, as his competition record in the Mazer Cup testifies.

I think it's fair to say that meadmaking has come a long way from the days when Roger Morse found consistent high levels of acetic acid in commercial meads during the 1950s, suggesting poor sanitation, or his 1973 survey which indicated that many commercial meads of the day were overly sweet, perhaps to hide poor fermentations. Recent articles in Spin Magazine, U.S. News & World Report, and Wine Enthusiast all show the growing public interest in mead. If you're in Boulder Colorado next Fall, consider looking into the International Mead Festival, where there will be samplings from 50 to 60 commercially produced meads. Or, look around for a local meadmaker who has a few good bottles in the cellar. We're not as scarce as we used to be.

Dan McFeeley
Kankakee, IL

Continued on Page 9

INNER COVER

The Tri-County Beekeeper's Association's Annual Spring Workshop was held again on the first weekend in March at the Ohio Agricultural Research and Development Center in Wooster, Ohio. It's always held that first weekend, and after 26 years it has become a harbinger of Spring – like the robins and Spring peepers.

The evolution of this meeting over the years has been interesting to watch. The sophistication of the planning has steadily increased as has the professionalism of the meeting itself. I can say with authority and experience that no national, regional or state meeting is better organized or well run.

And what a wonderful day! The timing is perfect for beekeepers in the northern parts of Ohio, Pennsylvania, Michigan and Indiana. After months of confinement, the cold and dark, and increasing anxiety and expectations of the season-to-be, this meeting is the beekeeping fix we need. There is, among beekeepers up here, a quiet fever that builds steadily from the time of the last inspection in the Fall until the first Maple bloom in March. It explodes when the weather breaks, the snow melts and you can pop a top just to see. But you can't quite get there by early March. You've been teased and tempted and maybe even you've tasted a couple colonies already, but it's still too early to do bees. This meeting is the drug we need, right when we need it.

For a single, glorious day, there's everything beekeeping.

It is, dare I say, the meeting you'd die for. All beekeeping, all day. No, absolutely no politics. None. No business meeting. No budget discussions. No overpowering fund raising events or auctions. No Board meetings to make far reaching decisions. No resolutions. No infighting. No elections. No banquets. It's all beekeeping, all day.

So much, in fact that you can't take it all in. The worst part of the whole day is that you have to choose the 'Spring Management' workshop or the 'Handling Beeswax' workshop. You can't do both so you pick one and wish you could do both.

Now, add to this workshop-induced euphoria the grandest assembly of beekeeping business displays you can imagine. Ohio is blessed with several in-state businesses that can meet the needs of every beekeeper, plus joining us are almost all of the nationally recognized operations – all those really big outfits that advertise every month in the journals – that have absolutely every new tool and gadget you've only read about right there to see and touch and ask about, plus the regular stuff you need and want. The cumulative effect is a healthy dose of tonic for all the bee fever sufferers from miles and miles and miles around.

And that's still not all. Imagine, if you will, standing in the middle of a crowd of over 600 people who do what you do, want what you want, think like you think, suffer as you suffer, and rejoice for the same things you rejoice over Every one of them, whether a 200 colony, 20 year veteran or somebody worrying about their first two colonies overwintering. We're all the same under the skin in March in Ohio. For a wondrous day you are no longer alone, no longer lost, no longer the outsider For a day you are home and all is right with the world.

But the world changed between the meeting last year, when over 700 people came for their fix, and this year It's a typical story lately. From my partisan perspective, Ohio's Governor and his cronies have done a monumentally inept job of managing the state's economy, and have tried to balance the budget by squeezing (among other things) The Ohio State University's budget, and cutting the Department of Ag to the bone, and our Inspection service severely. The Ohio State University, in response, has had to increase tuition, restrict activities, and increase fees to those who use their facilities.

Jim Tew, who is Ohio's State Extension Specialist in Apiculture has had, forever, the opportunity to work with OARDC in his capacity as an Extension professor, to sponsor meetings to educate his constituency – beekeepers. Every Extension person is (or was) expected to do this, and to facilitate this activity the University offered their facilities at a nominal cost. This is, after all, what educational institutions are supposed to do, right?

Jim, Sherry Ferrell and Dave Heilman work closely with both the University and Tri-County Beekeepers. As such, they have been able to use the facilities for beekeeper education for a reasonable price. This price, however, has been considerably lower than if an outside group wanted to use the same facilities.

Enter the recent economic downturn, which, I admit, hit Ohio especially hard, and money is tight. Very, very tight. Suddenly, those past relationships don't work. The University says full price. No exceptions. None at all. No arguments, excuses or begging allowed. Pay up or forget it.

Faced with this ultimatum the Tri-County group had no choice. They had to pay full fees for the facility. They doubled the registration fee. Doubled. Twice as much as the past several years.

To help defray costs without in-

Continued on Page 68

Meetings Matter

MAILBOX

One of Those Moments

The morning started peacefully enough with a cotton-candy sunrise and a hot cup of coffee. But that all changed at 7·15 a.m. when my husband – the King Bee, as I call him – burst through the back door wearing his mud covered bee suit and ordered me, still pajama clad, to our nearby walnut orchard where his flatbed, fully loaded with live hives, was now fully stuck in the mud.

The initial plan of pushing it out with our forklift wasn't working, so I pulled her around front to hitch up for a pull. While the King toiled with the chains, I caught the last puffy, pink clouds of the sunrise and enjoyed a picture perfect view of our huge daffodil patch which was just bursting into full bloom following the two inches of rain from the day before. It was a classic "Baxter Black-moment," as little mama in the 4-wheel drive Bobcat gave big daddy in his Dodge Ram Diesel a gentle tug, while our four little "buzzers," ages 11 mos. to almost 8, jumped up and down in the youngest one's crib and poked their heads out the window to watch the show (forget TV, we've got it covered!). Everyone who works with the unpredictability of Mother Nature knows these kind of sublime moments, when out of the blue, you are suddenly utterly tested, utterly humbled, and utterly entertained all at the same time and where you again fully realize how utterly blessed you are to be farmin' and ranchin' with the whole family, even through the mud and the ruts. The mighty little Bobcat pulled the big Beemover out no problem and the King Bee promptly made a bee line off the yard to go pollinate almonds, which left me just 35 minutes to diaper, feed, and dress my little brood inside before time to carpool to school. It was perfect timing, and I couldn't help but wonder, could there have been a more perfect way to kick off the bee moving season and get Spring into full swing?

Sheriann Houtrouw
Glenn, CA

To The Editor

It was with great dismay that I read your Inner Cover column in the January issue of *Bee Culture*. I can't conceive of your motivation in trashing the community of beekeeping scientists that serves our industry and the network of beekeeping associations that invites the scientists to participate in their meetings.

Your views surfaced during the ABF Convention in Jacksonville and resulted in formulation and adoption – without a word of dissent, I should note – of the following resolution:

APPRECIATION OF USDA-ARS BEEKEEPING SCIENTISTS

WHEREAS, the American beekeeping industry is well served by the four U.S.

Department of Agriculture, Agricultural Research Service beekeeping research laboratories in Beltsville, Md., Baton Rouge, La., Weslaco, Texas; and Tucson, Ariz., and

WHEREAS, the scientists of these USDA-ARS laboratories provide a valuable service to the beekeeping industry by attending meetings of U.S. beekeeper organizations where they learn of beekeepers' problems and activities through informal discussions and engage in technology transfer through presentations made on the formal program; and

WHEREAS, the attendance of the scientists at the beekeepers meetings serves to engender public support for the USDA-ARS beekeeping research program; now

THEREFORE, BE IT RESOLVED, that the Executive Director of the American Beekeeping Federation communicate the appreciation of the ABF membership for the good efforts of the USDA-ARS beekeeping scientists, especially their attendance at beekeepers meetings, to the leaders of the four laboratories, to the Administrator of the Agricultural Research Service, and to Ann M. Veneman, Secretary of Agriculture.

Thank you for giving your readers the opportunity to be exposed to an alternate view.

Troy H. Fore, Jr
Jesup, GA

Editor's Response: *Let's review this, should we? Other than PowerPoint, USDA honey bee researchers weren't trashed, as your letter states. Read again the editorial, Troy.*

And the Federation's brand new $100 award for "Best Scientific Presentation" at an ABF meeting can only add incentive for these researchers to do better, I believe.

What was cchallenged was the fact that USDA Bee Labs do not have enough money to do all that needs doing. Ask any research leader if their budget is large enough.

Moreover, USDA scientists don't often venture out on their own. There's a pretty well defined chain of command. They, mostly, are given permission to travel. So my point was, and still is, that with limited resources the USDA could expand its outreach and share the results of the work of its scientists better by rewarding scientists to write for their stakeholders. Now, they are seldom rewarded for this. Sometimes, they're punished.

This industry doesn't invest a lot of hard cash in directly funding USDA research (CA beekeepers, Almond industry, and perhaps a few others are the exceptions) but does spend money lobbying for continual support from government coffers.

Travelling to meetings to talk to a few hundred beekeepers is far less efficient than reaching out to thousands in a popular article.

When your income is limited you tighten belts and do without. With Bee Lab incomes limited, is it not better to tighten belts also?

I'll stand on my record of not only supporting but disseminating information provided by USDA scientists. But don't you wish there could be more?

APRIL – REGIONAL HONEY PRICE REPORT

Where is honey sold? In more places than you probably thought. Here's a list we sent out to our reporters, and their responses. The first column is percent of our reporters who sell at a particular location (i.e. 92% sell some honey out of their house). The second column represents the amount from all locations where honey is sold (i.e. 21% of all sales are made from the home by our reporters).

% of Selrs.	% of Their Honey Sales at these locations	
68	40	Home (inside or roadside stand)
17	23	Local community sponsored farm market (i.e. Saturday & Sunday sales)
24	23	Local Farm Market business that's seasonal (Fall only, for instance)
19	32	Local Farm Market business that's year-round
5	6	Flea Market
28	28	Health Food/Organic store
15	23	Gift Store
8	9	Specialty Outlet (salons, tourist outlets, airports)
23	22	Bakeries/Food Establishments
14	18	Local High-End Retail Outlets (gourmet stores)
26	24	Local, Small 'Mom & Pop' Retail Outlets (grocery & gas)
4	22	Local, Small, Franchise Outlets (7-11, Dairy Mart, Stop & Go)
15	40	Local Small Packer or Producer/Packer
6	66	Huge Packer, they pick up
17	40	Wholesale only to medium retail outlets (small chains) you deliver
4	44	Wholesale only to larger stores, you deliver to warehouse
3	5	Breweries/Beer or Mead makers
8	31	Internet, direct retail, mail order
17	19	Work, direct retail
5	27	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	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
55 gal. Light	1.46	1.59	1.46	1.25	1.50	1.37	1.56	1.63	1.46	1.35	1.48	1.50	1.25-1.63	1.47	1.47	1.32
55 gal. Amber	1.20	1.35	1.27	1.03	1.09	1.27	1.44	1.56	1.27	1.27	1.38	1.25	1.03-1.56	1.28	1.27	1.17
60# Light (retail)	100.33	115.70	107.92	93.50	115.00	100.00	114.13	106.07	120.03	107.92	110.00	93.00	93.00-120.03	106.97	103.03	90.58
60# Amber (retail)	93.67	107.95	105.05	92.80	115.00	90.00	107 14	105.00	115.50	105.05	110.00	83.25	83.25-115.50	102.53	95.15	84.34
Wholesale Case Lots																
1/2# 24's	37.60	38.02	48.00	45.18	59.04	35.50	37.28	85.00	53.41	35.76	35.00	50.40	35.00-85.00	46.68	37.52	32.83
1# 24's	55.63	57.68	89.00	23.02	69.36	56.00	56.80	58.96	53.20	77.76	77.40	68.00	23.02-89.00	61.90	58.07	53.15
2# 12's	49.09	57.52	54.86	48.30	59.04	49.00	49.98	58.95	51.80	57.84	62.00	60.00	48.30-62.00	54.86	52.28	47.90
12 oz. Plas. 24's	46.65	51.50	60.00	47.68	63.84	48.00	47.08	46.86	42.97	47.64	55.40	51.00	42.97-63.84	50.72	49.00	44.59
5# 6's	52.95	63.39	87.00	50.86	63.74	57.00	56.48	52.50	54.00	56.43	57.95	72.00	50.86-87.00	60.36	55.03	51.23
Quarts 12's	74.00	100.35	70.47	68.34	78.72	81.33	68.16	76.20	69.50	110.88	79.70	96.00	68.16-110.88	81.14	78.10	70.09
Pints 12's	43.50	49.95	48.45	42.70	49.20	49.33	42.95	42.78	43.17	55.90	45.00	54.00	42.70-55.90	47.24	48.99	47.07
Retail Honey Prices																
1/2#	2.18	2.61	2.75	2.27	2.50	2.15	2.24	2.82	2.38	2.68	2.68	2.75	2.15-2.82	2.50	2.48	2.29
12 oz. Plastic	2.69	3.18	3.50	2.94	3.23	3.37	2.80	3.62	3.33	3.55	3.60	2.90	2.69-3.62	3.23	3.10	2.94
1 lb. Glass	3.15	4.13	4.50	3.55	3.66	3.87	3.74	4.25	4.59	4.26	4.44	3.75	3.15-4.59	3.99	3.71	3.56
2 lb. Glass	4.55	6.54	6.93	5.95	6.25	6.99	5.79	6.95	5.99	6.36	6.08	6.25	4.55-6.99	6.22	5.90	5.67
Pint	4.50	6.70	5.21	4.50	5.00	5.17	4.86	5.76	5.40	6.50	4.65	5.50	4.50-6.70	5.31	5.64	5.33
Quart	14.92	8.95	9.18	7.10	8.50	8.32	8.19	8.81	9.00	12.00	7.83	9.50	7 10-14.92	9.36	8.69	8.42
5 lb. Glass	12.13	13.44	15.23	12.50	12.25	12.25	12.57	12.50	15.10	12.76	12.12	13.30	12.12-15.23	13.01	12.68	11.79
1# Cream	4.42	4.99	4.59	4.30	5.00	3.85	4.05	4.54	5.00	5.10	4.77	4.25	3.85-5.10	4.57	4.42	4.08
1# Comb	4.50	5.06	5.76	4.98	5.76	4.29	4.48	4.74	5.76	5.00	6.50	4.78	4.29-6.50	5.13	4.85	4.43
Ross Round	4.25	3.85	6.10	4.85	5.98	3.75	4.10	4.25	4.80	6.10	5.69	5.00	3.75-6.10	4.89	4.64	4.10
Wax (Light)	1.56	2.14	2.00	1.28	3.00	2.35	2.55	2.25	2.00	2.25	2.67	2.00	1.28-3.00	1.84	1.79	1.88
Wax (Dark)	1.25	1.83	2.75	1.13	1.75	2.17	1.84	2.00	1.70	1.75	1.85	1.63	1.13-2.75	1.47	1.56	1.95
Poll. Fee/Col.	48.75	40.67	32.50	32.00	37.50	40.00	44.07	40.00	30.00	41.51	52.50	48.00	30.00-52.50	40.62	41.40	39.27

2003 Honey Production

Honey production in 2003 from producers with five or more colonies totaled 181 million pounds, up five percent from 2002. There were 2.59 million colonies producing honey in 2003, up one percent from 2002. Yield per colony averaged 69.9 pounds, up five percent from the 66.7 pounds in 2002. Colonies which produced honey in more than one State were counted in each State and yields per colony may therefore be understated. Colonies were not included if honey was not harvested. Producer honey stocks were 40.7 million pounds on December 15, 2003, up three percent from a year earlier. Stocks held by producers exclude stocks held under the commodity loan program.

Honey prices increased to a record high during 2003 to 140.4 cents, up six percent from 132.7 cents in 2002. Prices are based on retail sales by producers and sales to private processors and cooperatives. State level honey prices reflect the portions of honey sold through retail, co-op and private channels. U.S. honey prices for each color class are derived by weighing quantities sold for each marketing channel at the U.S. level. Honey prices for 2003 were higher than the previous year for all color classes. Some 2002 crop honey was sold at the higher prices in 2003, which caused some revisions to the 2002 crop prices.

As informative as these numbers are, we always tend to do a bit of analysis because the best information isn't always the most obvious.

For instance, take a look at the five year summary of the number of colonies and honey production in the 10 most productive states. Combined, they consistently produce 74% of all the honey produced in the U.S. That leaves the rest of us scrambling to make even 26%. It's pretty clear that as these top 10 go, so goes U.S. production.

Those top 10 also manage the most colonies, not surprisingly.

Honey: Number of Colonies, Yield, Production, Stocks, Price, and Value by State and United States, 2003 1/

State	Honey Producing Colonies	Yield per Colony	Production	Stocks Dec 15 2/	Average Price per Pound 3/	Value of Production
	x 1,000	Pounds	x 1,000	Pounds	Cents	1,000 Dollars
AL	13	82	1,066	143	126	1,343
AZ	40	72	2,880	1,123	138	3,974
AR	40	75	3,000	810	127	3,810
CA	480	67	32,160	6,432	142	45,667
CO	24	86	2,064	722	138	2,848
FL	210	71	14,910	1,491	135	20,129
GA	52	65	3,380	270	128	4,326
HI	7	113	791	43	143	1,131
ID	100	46	4,600	1,380	135	6,210
IL	7	60	420	252	173	727
IN	5	56	280	78	159	445
IA	32	59	1,888	868	145	2,738
KS	16	57	912	447	158	1,441
KY	5	48	240	14	164	394
LA	34	90	3,060	275	124	3,794
ME	8	33	264	145	140	370
MD	2	42	84	21	191	160
MI	65	74	4,810	1,732	147	7,071
MN	120	83	9,960	1,892	146	14,542
MS	21	69	1,449	246	128	1,855
MO	17	53	901	189	141	1,270
MT	145	66	9,570	1,914	148	14,164
NE	45	74	3,330	1,299	143	4,762
NV	6	64	384	46	241	925
NJ	10	19	190	101	157	298
NM	6	41	246	108	116	285
NY	67	72	4,824	1,640	140	6,754
NC	10	44	440	79	190	836
ND	340	87	29,580	6,803	136	40,229
OH	15	50	750	278	143	1,073
OK	3	47	141	69	183	258
OR	42	51	2,142	964	126	2,699
PA	27	50	1,350	419	132	1,782
SC	6	70	420	13	195	819
SD	200	70	14,000	2,520	146	20,440
TN	7	40	280	53	153	428
TX	140	67	9,380	1,126	142	13,320
UT	23	57	1,311	144	130	1,704
VT	7	83	581	163	192	1,116
VA	6	37	222	69	169	375
WA	58	56	3,248	942	152	4,937
WV	8	47	376	194	201	756
WI	74	77	5,698	2,678	144	8,205
WY	39	81	3,159	474	140	4,423
Oth Sts4/5/	8	44	355	166	270	958
US 5/	**2,590**	**69.9**	**181,096**	**40,735**	**140.4**	**255,791**

1/ For producers with 5 or more colonies. Colonies which produced honey in more than one State were counted in each State. 2/ Stocks held by producers. 3/ Prices weighted by sales. 4/ CT, DE, MA, NH, and RI not published separately to avoid disclosing data for individual operations. 5/ Total colonies multiplied by total yield may not exactly equal production.

Continued on Page 72

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

". . . investigating the possible influence of bottom screens and hive entrance design on small hive beetle populations in honey bee colonies."

Research papers reviewed in this column typically follow a format that includes the author(s) description of an experimental design to test a hypothesis. To understand the hypothesis that is being tested can sometimes be difficult, but it can usually be deciphered from the experimental design. For example, if a researcher decides to test whether clover honey or soybean honey is equally adequate for overwintering in Illinois, the design used would likely compare the performance of a number of colonies fed equal amounts of the two types of honey over the Winter Let's assume that the researcher measures some parameter(s) of overwintering performance in the Spring and finds no measurable difference between the two groups following statistical analysis. In this case, the researcher is unable to reject the hypothesis that both foods are equally usable by the honey bees. Thus, the researcher infers that both honeys are suitable Winter food. Now let's take the other case – a researcher decides to test whether bees can survive the winter eating used motor oil as well as honey The researcher designs his/her experiments with multiple colonies set up to contain either motor oil or honey in the frames. By Spring, it is obvious that motor oil does not support overwintering, as all the colonies die. A statistical test is employed to compare resulting survivorship numbers and the results are found to be statistically significant. Thus, the hypothesis (that motor oil and honey are equally adequate for overwintering) is rejected and the researcher needs to go on to develop an alternative hypothesis that can be tested (or in this case, if she/he actually tested the motor oil hypothesis, perhaps the next step is to look for another job). It is an interesting exercise to examine research reports and look for the underlying hypotheses that are being tested, how the reported results relate to the hypotheses and how the researchers use those findings to either tentatively accept the hypothesis (in the case of the soybean/clover honey experiment) or reject the hypothesis and go on to discuss alternatives (as in the motor oil experiment) Finally, it is useful to recognize that hypotheses can only be tentatively accepted. Why? Because, as the result of inductive reasoning (the particular tested case or cases) they are always open to retesting and possible refutation.

This month, we will take a look at a paper investigating the possible influence of bottom screens and hive entrance design on small hive beetle populations in honey bee colonies. The small hive beetle, *Aethina tumida*, is a relatively recent pest of U.S. honey bee populations, especially problematic in the southern states. The beetle larvae live and feed inside honey bee hives and, when populations build up, can cause the collapse and loss of honey bee colonies. As the beetles pupate in soil outside the colony and adults infest colonies by re-entry, previous work by Ellis and colleagues suggested that hive entrance modifications (the use of PVC pipe entrances) could reduce beetle populations. In a more recent study, Ellis *et al.* examined these design changes in multiple apiaries utilizing additional modifications to improve ventilation (screened bottom boards). In the experimental design, the researchers tested 6 "treatments" screened bottom board and normal open hive entrance, 1.9 cm PVC pipe entrance and screened bottom board, 1.9 cm pipe entrance and normal solid bottom board, 3.8 cm PVC pipe entrance and screened bottom board, 3.8 cm pipe entrance and normal solid bottom boards, and normal solid bottom board and normal open hive entrance. There were four sets (replicates) of these treatments at each of two different apiaries. The colonies started virtually free of small hive beetles but were placed in two apiaries containing other infested non-experimental hives. After 70 days – the hives were disassembled and measurements were taken to determine the small hive beetle numbers, *Varroa* mite numbers, individual bee weight, presence of a laying queen and the number of frames of honey, pollen and brood.

The findings of the experiment were quite interesting. Ellis and colleagues reported that in one of the apiaries, there were significantly more small hive beetles in colonies with the open entrances than in

Continued on Next Page

RESEARCH ... Cont. From Pg. 13

colonies with the 3.8 cm pipe entrances. The numbers of beetles in the 1.9 cm pipe entrance colonies were not significantly different than either of the other entrance types. However, in the second apiary, there were significantly more small hive beetles in the 1.9 cm pipe entrance colonies than either of the other types. In this second apiary, there were more small hive beetles in the colonies without screens than in the colonies with screens, yet there was no effect of bottom screens on small hive beetle numbers in the first apiary There were effects of entrance type on honey production and brood production, although it was somewhat variable. The authors conclude that it is "prudent to limit the use of the candidate integrated pest management . strategy to non-production seasons" There were no measurable treatment effects on the number of *Varroa destructor* in the colonies.

Overall (using the language of the early part of this article), the statistical findings in this study were such that the hypothesis (that beetle numbers are unaffected by entrance type) could not be rejected. As these results were in contrast to previous findings reported by the research group (where the pipe entrance had been shown to reduce beetle numbers), the authors discussed alternative hypotheses that may have accounted for the variable findings (colony strength differences due to nectar flow variation between apiaries, variable invasion pressure from small hive beetles in the two studies, etc.). These alternative hypotheses themselves can be tested by the authors in the future. In any case, they are now available in the scientific literature for testing by the larger research community The interpretation of these research findings in light of previous work provides a good example of the methodological underpinning of science and how progressive evaluation and testing of hypotheses contributes to greater understanding of the world around us and, in this particular case, the interaction of small hive beetles and honey bees. BC

Ellis, J.D. Jr., K.S.Delaplane, R. Hepburn and P.J. Elzen. 2003. *Efficacy of modified hive entrances and a bottom screen device for controlling* Aethina tumida *(Coleoptera:Nitidulidae) infestations in* Apis mellifera *(Hymenoptera:Apidae) colonies*. J. Econ. Entomol. 96:1647-1652.

Dr. W. Steve Sheppard, Thurber Chair, Department of Entomology, Washington State University, Pullman, WA 99164-6382, shepp@mail.wsu.edu; http//apis.wsu.edu

NUMBERS

Keeping How Many Bees, How Long?

68% of our readers have 25 or fewer colonies, 28% run between 26 and 300, and 5% have more than 300. This reflects the U.S. beekeeping population (70-20-10) estimates we made a couple of years ago based on independant data we collected.

17% of our readers have been keeping bees fewer than three years, 35% between three and seven years and 48% more than seven years.

Mark Winston

NORTH TO . . . CANADA?

"We have crossed an invisible line in North America from beekeeping as a quirky, interesting, and family-run enterprise to beekeeping as agri-business."

Canadians are slower than Americans. We leave voice-mail messages at a pace that allows the recipient to actually decipher the name of the message-bearer, and their phone number. We drink our beer at lunchtime more slowly, either because we're not in a big hurry to go back to work or else we're knocked back by the high-octane alcohol content of Canadian brews. And it takes us a long time to make decisions, since reaching unanimity and consensus through compromise and conciliation is hard-wired into the Canadian psyche.

Thus, it's not too surprising that our beekeeping community has made only glacial progress in addressing importation issues concerning bringing queens and/or package bees into Canada from the mainland United States. Our border has been closed to imports since 1987, although the issue is raised for discussion pretty much every time two or more beekeepers get together at their local Tim Hortons for doughnuts and coffee.

Nothing has happened since 1987 to change the closed-door policy, dictated by the will of the large majority of Canadian beekeepers, to keep that door shut to the importation of live bees. The only exception has been the occasional highly quarantined importation of breeding stock, and even that has been rare and under considerable regulation.

Canadians, however, are not all as law-abiding as our reputation suggests. There have been quite a few rumors around about illegal importations, and sufficient apprehended smugglers to suggest that the rumors are just the tip of the iceberg. Honey prices are high, beekeepers want to expand their apiaries each Spring, and the temptation to smuggle has been acute in certain circles.

Recently, however, there has been growing pressure from the broader beekeeping community to open the border to legal queen importations. My theory is this movement has emerged in part from the Canadian sense of fair play, with the law-abiding majority hoping to reform the criminal fringe elements by removing the temptation to smuggle. For whatever reasons, the glacial Canadian body politic has begun to move, albeit slowly towards relaxing the import restrictions.

Our industry crossed a new boundary at the annual Canadian Honey Council meetings in bitterly cold Winnipeg during late January, 2004. For the first time since 1987, a majority of provincial representatives voted in favor of allowing the importation of honey bee queens and their attendants from the continental United States. The proposed movement of queens would not be uncontrolled. Entry into Canada would require a permit under the Health of Animal Regulations act, with conditions still to be specified.

Some provinces would continue to prohibit even these limited importations, and the Council's resolutions made it clear that they want the border to remain closed to package bees or bees on comb for at least another two years. Still, it's a shift, and although subtle does begin to open up the trade in bees that was shut down suddenly over 15 years ago.

But not so fast. As slow as our beekeeping community may be in making decisions, our government is even slower Unless a politician at an unusually high level puts some heat on, it is unlikely that we'll see queens imported into Canada from the mainland before 2005. Agriculture Canada is stretched well beyond its capacity right now due to BSE, and the beekeeping industry is pretty low-clout compared to the cattle business.

Unfortunately a number of beekeepers jumped the gun and ordered queens from the U.S. for April 2004, and are now beginning to regret their haste. Or, perhaps they are making plans to have their queens shipped to a post office box just south of the Canadian border, near a quiet border crossing where a few thousand rustled queen bees might go unnoticed.

Whatever the pace, it appears likely that we will once again be importing queens from America, and my guess is that package bees and even bees on comb will follow. The rationale to ban shipments arose from pest, disease, and Africanized bee concerns which at the time were not present in Canada. Natural cross-border movement, over-use of chemicals and smuggling have combined to bring us tracheal mites, *Varroa*, resistant *Varroa*, and resistant AFB, so that the arguments to restrict importations for sanitary reasons have become harder and harder to rationalize.

We still don't have small hive beetles or Africanized bees, and

Continued on Next Page

"For now, we in Canada continue to fiddle while Rome burns. An inordinate amount of time and energy remains focused on the border, while within our own borders the health of our bees and the purity of our products descends deeper and deeper into the soup of chemical dependency."

opening the border is likely to bring these issues into Canada. There are differences of opinion about whether the benefits of importation override the concerns raised by these two problems, but apparently Canadian beekeepers now believe the tradeoff between access to queens and the threat of importing killer bees and killer beetles favors the queens.

What might the new face of North American beekeeping look like with a fully open border? Who will win and who will lose from transparent borders where bees might move anywhere from the coldest reaches of Canada through the United States and down into Mexico, our other free-trade partner?

I recall a conversation with a mega-beekeeper from the United States years ago, whose outfit ran tens of thousands of colonies. He was speculating about a system where he wintered in Mexico, pollinated in California, went up to Canada's Peace River country in July/August, and finished back in Mexico in the Fall. Imagine strong colonies emerging from Mexico in February to earn pollination fees in California on a couple of crops, then on to Canada for those 250-300 pound honey crops that the Peace River is famous for.

With that kind of a business, a guy could make some money. Or, at least an American guy with 15-20,000 colonies can make some money. How about the guy from the Peace River who has 500 colonies and doesn't have the resources to move his bees all over the continent? Suddenly he's faced with a conglomerate, having to compete with the economies of scale that a large operation brings with it.

I know that's the free-enterprise, competition-based way we do business in North America. Still, it's worth noting that beekeeping is going the way of other agricultural endeavors, towards large companies with deep pockets and the means to operate over large territories.

We also have approached and surpassed the dependence of farmers on pesticides and antibiotics to maintain high crop and livestock production. For bees, legal and illegal movement of bees across the United States and Canada has contributed to the spread of diseases and pests, forcing beekeepers to join the ranks of those we used to despise, chemically-dependent farmers. Indeed, we have failed to learn the lessons taught to our counterparts in crop production, whose pesticide use is decreasing while ours grows.

Will the decision to open the border lead to increased use of antibiotics and pesticides in Canadian colonies? It's worth noting that queen smuggling and the importation of illegal chemicals seem to have gone hand-in-hand across Canada. Interestingly, regions of our country where rumors of queen smuggling abound also are areas where problems with resistant pests and diseases have flourished.

An open-border policy certainly won't reduce the spread of current and new pests, and more likely will augment it. We need to anticipate increased problems with both pest management and resistance as bees move more freely across borders. Unfortunately, Canadian provincial and federal governments reduced funding to extension, research and regulatory programs years ago, leaving our beekeeping community more vulnerable to novel management challenges than 15-20 years ago, when the cascade of mites and diseases began descending on North America.

Should we keep the border closed, then? Are Canadian beekeepers making a fatal error by encouraging the legal movement of bees across our border? There is little doubt that the border closure was useful and important for Canadian beekeepers until now, but is it still justifiable?

I'm not sure this is the most interesting question in beekeeping today. Pest and disease problems have become epidemic. Over-use of pesticides and antibiotics, and resistance to their effectiveness, are rampant. The use of illegal substances has become a stain on our once-pristine industry. Free bee movement across borders might make that situation worse, and for that reason keeping the border closed might be advisable, but that has become a side issue to a much bigger problem.

We have crossed an invisible line in North America from beekeeping as a quirky, interesting, and family-run enterprise to beekeeping as agri-business. It took us longer than other agricultural industries, and there are still outposts of smaller-scale beekeeping, but fundamentally we no longer can claim the high ground of being a sustainable and environmental reflective industry.

The border issue has been fought over economics, but hidden beneath it has been the slow, inexorable descent of beekeeping into the common slew and malaise of North American agri-business. I was privileged to have had the opportunity to work in our industry during an earlier, less cynical era, and remain unrealistically hopeful that we can return to a time when the words "beekeeping" and "environmentally friendly" could be linked.

For now, we in Canada continue to fiddle while Rome burns. An inordinate amount of time and energy remains focused on the border, while within our own borders the health of our bees and the purity of our products descends deeper and deeper into the soup of chemical dependency.

Instead of the border, let's start a discussion about whether we are communally satisfied with the state of our industry, and if not let's do something about it. BC

Florida Bee Inspection in the New Millenium

Malcolm T Sanford

"Jerry inherits several situations that are sure to try his communication and administrative skills in the near future. At the top of everyone's list is the increasing resistance to pesticides by *Varroa* mites."

Mr Laurence Cutts has written an extensive history of Florida beekeeping, published on the Florida State Beekeepers World Wide Web site.[1] "The Florida State Beekeepers Association was organized at Gainesville on October 6, 1920. It was anticipated that it would make for rapid improvement in the beekeeping industry of Florida. A report of the organizational meeting states that a group of 100 enthusiastic beekeepers from all over the state were in attendance. The first officers were: J. W Barney of Bradenton, President; F K. Isbell of Wewahitchka, Vice President; K. E. Bragdon of Cocoa, Secretary; and J. R. Hunter of Wewahitchka, Treasurer It is also stated that the establishment of the state association followed the organization of several strong local associations. On the same page is a classified ad for two- or three- frame nuclei from the Sarasota Bee Company, the beginning of a segment of the beekeeping industry that became a major part of the industry here in later years."

With reference to bee inspection, he says: "Apiary Inspection was created by Legislative Act on June 9, 1919. The Plant Commissioner in 1919, Dr Wilmon Newell, was experienced in bee diseases, having been in charge of the Texas program for five years. He appointed Mr. C. E. Bartholomew as the first State Inspector and assisted him with inspections the first year. Initial inspections were in the Apalachicola river region, which was reported to have more bees than any other area of the state. The tupelo honey produced in this region was valued at this time as a good honey to blend with other varieties of honey to retard granulation. Beekeeping in this area was also enhanced by steamboat transportation and bees were routinely moved into Alabama and Georgia for the summer and back into Florida for the spring. The number of colonies in the area coupled with the migratory nature of beekeeping there made the spread of disease a major concern. The finding of disease in one large apiary in 1918 caused beekeepers there to petition the legislature for an apiary inspection program with laws that would help prevent the movement of diseased colonies into Florida."

Since then, bee inspection in Florida has been known as one of the best-run and most-supported beekeeping services in the U.S. There have been relatively few chief inspectors over the years contributing to its stability. Several have had long tenures, including Mr. Cutts himself, who recently retired after a decade and a half of service. Dr Roger Morse, well known for his writings in Bee Culture, was Florida's chief apiarist for a period and authored a document on Florida beekeeping. Innovations in bee inspection have been the watchword in Florida over the decades.

According to Mr. Cutts, "On July 1, 1957, an Act of the Florida State Legislature became effective which provided to beekeepers compensation for bees and equipment destroyed by the state because of American foulbrood. Florida was the first state to implement such a program. The compensation program increased cooperation between the Department of Agriculture and the beekeeping industry and contributed to a steady decline in the incidence of American foulbrood in the state." This program remains in place and has helped beekeepers weather the recent storm of antibiotic-resistant foulbrood.

Florida bee inspection has also been a leader in establishing consistent pollination services through what is called the Eastern States Agreement. This promoted orderly movement of bees on the eastern seaboard for vital pollination services in the face of chaos caused by exotic pest finds (tracheal and *Varroa* mites). Florida was one of the first states to declare itself infested with tracheal mites, and then *Varroa*, and go about the business of getting chemicals registered for treatment. It continues to lead in this field. Florida bee inspection is also in the forefront in monitoring possible spread of Africanized honey bees eastward. Finally, the program is known for actively consulting

Continued on Next Page

1. http://floridabeekeepers.org

FLORIDA ... Cont. From Pg. 19

its constituency through both the Honey Bee Technical Council and the Africanized Honey Bee Task Force.

Florida bee inspection has been threatened over the years by proposals to reduce or eliminate its funding, but has continued to survive due to support of the beekeepers it serves through efforts of the Florida State Beekeepers Association. The situation becomes more acute when there is a turnover in the chief apiarist, the person administrating the program. It weathered the storm again with appointment of Gerald W. (Jerry) Hayes, who assumed the post early this year.

Mr. Hayes comes to Florida from Dadant and Sons, Inc., where he was new product manager and wrote (and will continue to write) the column known as "The Classroom" in American Bee Journal. Although born in New York, Mr. Hayes family moved to Ft. Lauderdale in the 1950s. Thus, he has a good many relatives scattered around the state. Jerry majored in athletic administration and coaching at the University of Southern Mississippi in Hattiesburg, MS and coached track and football at various schools. He taught other subjects as well such as driver education. While working in the electronics and plastics industry, he credits a beekeeper of Slovakian descent, Tom Biernasz, for introducing him to beekeeping. Quickly, his initial bout of "bee fever" got out of control. Thus, in 1980 he found himself in the one place in the U.S. that had a beekeeping curriculum, The Agricultural Technical Institute in Wooster, OH. He graduated under the tutelage of *Bee Culture's* most prolific contributor in recent years, Dr. Jim Tew.

After graduation, Jerry did a stint at the Baton Rouge Bee laboratory, working with Drs. Allen Sylvester and John Harbo, before moving on to work at Dadant and Sons, Inc. in Hamilton, Illinois. His interest and experience in new materials (plastics) made him a natural contributor to the company in various ways, especially in developing catalogs for subsidiaries, such as American Bee Supply in Lebanon, Tennessee. He has, thus, been involved in everything from plastic hive parts to registering beekeeping treatments, as well as his educational column that answers questions mailed in by readers. These activities and his administrative experience will be invaluable to beekeepers in Florida.

I recently sat down with Jerry at his office in Gainesville, Florida and we chatted about the kinds of challenges that he will face. First and foremost will be developing a distinctive personal relationship along with a brand-new administrative style for both beekeepers and employees. The latter include dedicated administrative folks in the office led by the able Ms. Cathy DeWeese and some 14 beekeeper-inspectors in the field. Coming up this spring will be an increase in fees for registered beekeepers. All colonies in Florida must be registered with the Division of Plant Industry. The fees collected are only about $40,000. When compared to the full apiary inspection budget of $375,000, there is little question that beekeepers are getting their money's worth. But as the challenges to effective beekeeping mount, it is increasingly more difficult for even the best-managed outfits to survive. Every beekeeper forced out of business becomes one less voice in support of bee inspection.

Jerry inherits several situations that are sure to try his communication and administrative skills in the near future as revealed in a recent meeting of the Honey Bee Technical Council, a body set up by Florida's Agriculture Commissioner to advise him about beekeeping issues. At the top of everyone's list is the increasing resistance to pesticides by *Varroa* mites. In many areas, neither labeled chemical, fluvalinate (Apistan®) or coumaphos (CheckMite+®), is effective. Thus, the Division of Plant Industry has received a section 18 emergency-use label for ApiLife Var®, an essential oil product. However, use of the latter product is much more labor intensive and less effective generally than the others. In addition, it is not a good strategy to have emergency use labels for two products at the same time. EPA frowns on this; there is a danger that it will demand that only one material can be so labeled at any time. There was discussion about the use of formic acid. This, however, is an enigma both from effectiveness in subtropical Florida and its legality. I wrote about the current formic acid situation in an earlier edition of *Bee Culture* (June 2003).

Another worrisome situation is that American foulbrood resistant to Terramycin® (oxytetracycline) appears to be on the rise in Florida. Thus, there is a hue and cry to speed up registration of an alternative material like tylosin lactate. Should this happen, inspectors and educators (extension workers) everywhere in the country will have their work cut out for them. They must change the collective beekeeper mind set from using antibiotics for prevention (prophylactically) to only employing them when symptoms are seen. It is possible the material may be issued only on a prescription basis. In Florida, this will be especially problematic. It may require a change in the law, since colonies with symptoms are required to be burned by inspectors.

Finally, there is the issue of Africanized honey bees. The Florida climate is recognized by most authorities as almost perfect for this tropically-adapted honey bee. Fortunately, the insect has not migrated eastward from Texas, and so this insect is not established in the state. Nevertheless, there continue to be introductions via ships; Florida bee inspection maintains a series of trap hives around ports, especially Miami, Tampa and Jacksonville to catch stray swarms. This situation is complex because exact identification of these bees is problematic and continues to become more convoluted as time goes on. A revised protocol on this trapping program was mandated at the Technical Council meeting. Naturally, that job falls to the new chief inspector, Jerry Hayes.

Given this background, the following major goals have been established by Jerry and his supervisors:

1. Rewrite the field procedures manual. This will be a major undertaking as the document has not been updated for several years. There have been many changes in beekeeping management, which must be reflected in such a document. These include conditions related elsewhere in this article and recent introduction of the small hive beetle (*Aethina tumida*).

2. Produce an administrative procedures manual. This will entail some extensive examination of how bee inspection currently works in the state. It will be studied from a flow chart perspective. One goal is to carry out more and more of these procedures on computers so that efficiency can be maximized. This will entail bringing bee inspectors into the digital age. The use of portable digital assistants (PDAs) and computers will be emphasized. There could be some huge benefits to beekeepers from this initative. Bee inspectors are known to be credible in beekeeping circles. Their use of digital devices cannot but help in the dissemination of this technology to beekeepers.

As part of this effort the Division of Plant Industry will emphasize more development of its already extensive World Wide Web site.[2] Right now it consists of the basics of the program, which includes a map of the 12 inspection regions in Florida, who is responsible for each and a list of registered beekeepers. Various links to educational resources and entities such as the Florida State Beekeepers Association are also integrated into the site.

3. Work with industry, government and academia to provide sustainable, safe controls for the many organisms that now affect honey bees. Mites are on top of the list, but bacterial diseases and other insects (wax moth, small hive beetle) also must be taken into consideration. The ever-important labeling of materials for pest control continues to take on a more regional emphasis. Thus, the Division of Plant Industry will become more involved in research emphasizing Florida conditions. This has already been accomplished to some degree in small hive beetle research, where the Division and the local branch of the USDA, Center for Medical and Veterinary Entomology on the University of Florida campus, have collaborated on small hive beetle trapping research.

4. Educate the public on the importance of honey bees, beekeeping and bee inspection. The activities planned in this arena range from a static display to a video presentation. These include publishing information to hand out and demonstrations at fairs. A major educational effort supported by the Division of Plant Industry is collaboration with Florida Ag in the Classroom, a school-based educational program.[3]

5. Provide exemplary consumer service for both beekeeping constituents and the general public. For bee inspection, this is critical. Much of this is already in place for beekeepers. They receive a packet of information as part of their yearly registration. At this writing it includes pamphlets on the Africanized honey bee and other topics, a summary of the apiary law and an apiary inspection evaluation. In the final analysis this is "where the rubber meets the road" in bee inspection. For without the consent and cooperation of those being regulated, no program can be considered successful. How Jerry Hayes handles these challenges will be the subject of other articles and the measure of his success as head administrator of one of beekeeping's showcase regulatory programs. BC

Dr. Sanford is a former Extension Specialist in apiculture at the University of Florida. He publishes the APIS newsletter, http://apis.shorturl.com

2. http://www.doacs.state.fl.us/pi/plantinsp/bees.html

3. http://www.fl-ag.com/faitc/aboutus.htm

QUEEN ESSENTIALS

"The colony's nerve center doesn't control egg laying, swarming or other behaviors. But without her, there is no colony

Larry Connor

Egg Laying by the queen bee

The exact number of eggs a queen lays each day is difficult to quantify, but we can put together numbers that will start our discussion. Most references suggest that during the active brood rearing season (roughly a four-five month period from February through June, depending upon where you are in North America), a queen lays between 1,200 and 1,500 eggs per day, as based on the amount of brood present in a colony.

If a single queen is laying 1,500 eggs per day for 21 days – the length of development of worker bees – there should be 1,500 divided by 25 cells per square inch, or 60 square inches of eggs each day. When we multiply 60 square inches by 21 days we get 1260 square inches of brood in the colony.

A standard deep Langstroth frame holds foundation measuring roughly 17 x 9 inches or a bit more than 150 square inches of brood per side, or about 300 square inches per frame. When we divide 1260 square inches of brood by 300 square inches per frame, the result is that there are a little more than four frames of brood produced in this colony.

Experienced beekeepers know that it's a rare queen that fills *every* cell in a comb with eggs, so the 1260 square inches of brood may be present on six to nine frames in a colony. For example, if the colony leaves a one-inch border around the brood, the brood area would be reduced to 15 x 7 inches, or 105 square inches/side for x two sides, or 210 square inches of brood on one frame. Dividing that into 1560, we get 7.5 frames of brood. This more realistically reflects what you might see in a 'normal' colony.

My point is this: a vigorous queen laying 1,500 eggs per day will generate brood on six to nine frames yielding about 31,500 bees emerging over the next 21 days. The weight of these bees, at 3,500 bees per pound (average) gives us nine pounds of bees produced in 21 days.

Number of bees in a hive

If we project these numbers forward, we can predict the number of bees in a colony. Conveniently for us in our computations, some scientists estimate that worker bees live about six weeks post emergence,[1] providing an adult population of about 31,500 bees x two brood cycles, or 63,000 worker bees in a colony. That is 18 pounds of bees – the equivalent of six three-pound packages of bees in one hive. This is an impressive number of bees to observe.

There are reports of colonies where queens produce 3,000 eggs per day over an extended period. If true, this would provide a colony of 126,000 worker bees, with a weight of 36 pounds, with a brood area covering 12 to 18 frames, depending on brood pattern. This is impossible, right?

Not if there are two queens in one colony. I have routinely seen two queens during the Spring build-up period, when 10 to 20 percent of all the overwintered colonies I inspected held multiple queens.[2] In almost all cases, these were mother and daughter queens laying eggs in the same hive, and sometimes on the same side of the same comb. Did they ignore the memo about queens fighting to the death? Didn't they watch the special on the Nature Channel? Or did they simply agree to forego unpleasantness and decide to set examples for mothers and daughters everywhere?

Worker bees and queens continue to exist without replacement queen production until the queen is producing about half the number of eggs she did as a matter of routine. Even after such a dramatic decline in brood rearing, the old queen is allowed to exist in the colony for as long as possible. The workers may desire to produce more reproductive bees from their mother's eggs for as long as possible, and do not kill her, rather than use eggs from their mother's replacement queen. This is one aspect to a genetic advantage to keeping the old queen around.

There is also a second very strong evolutionary advantage allowing the old queen to continue to live and laying eggs at a reduced rate. In an effort to produce a huge population of bees to generate multiple large swarms from the parent hive, keeping two queens helps insure survival of the 'daughter' swarms. This is maternal sexual reproduction at a different level: rather than reproduction of the individual queen, we are concerned with the biological process involved in reproducing an entire colony. The simple natural reality is

[1] I think that six weeks must be a seasonal average, because during the rapid build-up period of the season and during periods of intensive forage, the adult life of the bee lasts only three or four weeks. Of course, during the winter months, worker bees live from September to February or March; it is brood rearing which depletes their food reserves and causes aging. All parents raising children know this.

[2] I learned this the hard way when I was trying to raise queen cells. It was quite easy to open a colony, find a queen, remove her, and assume the colony was queenless for cell producing reasons. When all the cells were destroyed by the remaining queen I went searching and found the second queen. Some stocks tolerate mother-daughter queens, and these are sometimes called "Supercedure" strains. A Supercedure strain was selected in England some years ago, but I am not aware of such a stock in North America.

Continued on Next Page

this: the largest and earliest swarms enjoy the highest rate of building a colony, having success in overwintering, and reaching their first birthday alive. The opposite is just as instructive: late and small swarms suffer the highest failure rate of all swarms.

Nest Size, Colony Expansion & Colony Survival

Bee nests in hollow trees are between 15 to 80 liters (one liter = 1.0567 liquid quart) in volume, anything smaller would not be large enough to hold the stored honey needed (about 15 kg) to survive the Winter [3] A contemporary single deep hive body contains about 42 liters and a double deep hive body contains 84 liters. Thus beekeeper-managed colonies are almost always in boxes similar to the largest nest volume found in nature.

During Winter, New Haven, Connecticut based colonies lost between 20 and 26 kg in weight, most of which was due to the consumption of stored pollen and honey This agrees with beekeeper practices of leaving a minimum 60 pounds (27 kg) (a deep hive body) of stored honey in the hive for Winter stores.

Such colonies experience a very rapid buildup in the Spring, with colony mass (weight) – as expressed as brood, bees, stored honey and stored pollen – rapidly increasing from about 15 to 20 kg in April to 65 to 75 kg in July. During this time the colony may swarm once or even twice. Any further swarming may result in too much of a decline in the colony's population and reserves, making it less likely to survive the Winter

Swarms vary in size, but the average prime swarm is about 16,000 worker bees, the mother queen or several daughter queens, and a few drones (the drones produced during swarming season visit drone congregation areas, and do not need to travel with the swarm). In seven colonies monitored by Winston, prime swarms ranged from 11,676 to 21,818 bees while 1st afterswarms ranged from 6,091 to 14,625 bees. Two colonies produced 2nd afterswarms that were 3,765 and 4,086 bees, and one colony produced a 3rd afterswarm of 4,296 bees. It does not take much imagination or beekeeping experience to know that the 3rd afterswarm has a much reduced chance of survival. That is why I recommend to beekeepers that they add such small swarms to colonies that will benefit from additional bees.

This brings us back to the first part of this article, about egg-laying rates. At 1,500 eggs per day, a loss of 16,000 worker bees represents a little over half of one brood cycle's worth of worker bees. When you consider that half the colonies issued a second swarm (1st afterswarm), some of which were nearly as large as the first, then you realize that swarming represents about a month's worth of labor and resources invested by the bees during the critical three-month buildup period, so important is this reproductive swarming. For beekeepers, it represents a month or more effort by the bees lost in terms of buildup, pollination services, and honey production. Remember that during swarming, foraging slows, and more bees are 'hanging out' in the hive. Also, keep in mind that this is not a lost month out of the 12-month calendar, but one month lost out of three months of the very critical buildup period in the annual cycle of the hive.

Before I move on, I don't mean to suggest that many natural colonies reach the 3,000 eggs-per-day yield of 126,000 bees (36 pounds) I just don't see this happening. Beekeepers can come close by using a two-queen system of management, a highly desirable management system I hope to discuss in a later article.

Who's in Charge?

We often speak glibly that "the queen did this, the queen did that" but when we do we are not accurately describing what is actually happening. The queen does what she is allowed, encouraged, and stimulated to do by the worker bees from the moment they determine – when the future queen is a tiny larva – that she will become a queen rather than a worker bee. The workers also control her confinement to a cell at emergence, keep her separated from other new queens during swarming, and make sure she's 'kept around' by genetically loyal daughters who tolerate a 50% drop in egg laying to keep "mom" in the hive. During the day-to-day life in a hive, workers control the rate of the queens feeding and the number of queen cells prepared for her to lay into, thus determining the rate of egg laying of the queen. This is why stock evaluation tests should allow for the replacement of old bees when a queen is introduced into a colony. Not only do you need to evaluate the queen, but you must also evaluate all behaviors of the worker bees she produces!

Just about the only independent act where workers do not assist the queen is in mating itself: that is solely the business of the virgin queen and the hundred or more drones chasing her in a drone congregation area. She mates drone after drone, sending them falling to the ground paralyzed and unable to fly, their reproductive guts spilled out of their abdomens. The

[3] Seeley, Thomas D., 1985. Honeybee Ecology, A study of adaptation in social life. Princeton University Press. Out of print, but available as a Print on Demand text via Amazon.com. Many of the additional facts about bee nests, swarming and related issues are from this very useful reference.

next drone mounts the queen in the air and pushes aside the endophallis of his predecessor When she returns to the hive she's carrying the last drone's endophallis (the mating sign) in her reproductive tract. Immediately the worker bees attend to her, removing the male remains, and massaging her body to help the sperm migrate into her spermathecia.

Queen Development

As I just mentioned, worker bees decide which young larvae will become queens, and there is competition between workers with different drone fathers as to which larvae are selected and which queen cells will be finished. Queens also lay into the queen cups during swarming season.

Since queens develop from fertilized eggs identical to the worker bees, all worker and queen eggs hatch in three days. For five days the queen larva is fed food produced by the worker bees known as royal jelly, which they provide in surplus for the last-stage larva. Then the cell is sealed by the workers and the queen larva spins a cocoon inside and undergoes her complex metamorphosis to an adult queen. She emerges from the cell seven days later

When sexually mature, about 10 to 12 days after emergence, the queen leaves the colony to mate with drones from many colonies found in drone congregation areas. On average, she receives about 85 million sperm during mating. There may be one or more mating flights, and she mates with upwards to 20 drones. When she returns to the hive, her median oviduct is filled with all these sperm, and she rests on the comb and moves her body in such a way as to encourage sperm migration. Worker bees also massage her body during this period.

The final result is that between five and eight million sperm enter the spermatheca. The rest of the sperm are expelled from the queen's body as thin, brown strands of dry semen. Worker bees help remove this material. If the queen is unable to remove the sperm from the median oviduct, the queen will not be able to lay eggs properly. This sometimes happens in natural mating, but is a tremendous concern in the instrumental insemination process. If the sperm do not migrate to the spermatheca within 24 to 48 hours, there will be a mass of sperm that blocks eggs from passing through the median oviduct; this sometimes results in the queen's death.

Inside the queen's abdomen we find a pair of ovaries, each holding about 360 ovarioles, or egg tubes. They are joined by the lateral oviducts connecting to the median common oviduct (where the sperm are temporarily stored during mating). The vaginal oriface enlarges to form a vaginal chamber which has a finger-like, ribbed structure called the vaginal valvefold. The valvefold opens and closes passage to the oviduct by muscle action. This valvefold makes instrumental insemination difficult, since it must be moved out of the way in order for the syringe to enter the median oviduct, before sperm may be released. If the queen is not open, the semen will leak out into the sting chamber; none of the spermatozoa will enter the spermatheca.

The spermatheca holds about one microliter of fluid, and is connected to the oviduct by the spermathecal duct. This duct has muscles attached to it and is involved in pumping sperm into the spermatheca after mating, and releasing sperm during egg-laying.

The spermathecal gland is attached to the spermathecal duct; it covers the spermatheca like a wig. This gland secretes and activatates substances that contain nutrients to waken the sperm after their long rest in the spermatheca. The median oviduct is 0.33 mm in diameter, and eggs are 0.39 0.42 mm in diameter This means that the egg must be compressed, squeezed out of shape, as it passes through this structure. Sperm stored in the queen will remain alive for many years, at least five years in the literature. And, since queens do not mate again this is understood to be the longest period of sperm storage reported in any animal. And yet we poorly understand the mechanism of storage: what nutrient solutions are being provided to the sperm to keep them in a state of suspension?

Queen Chemicals

Chemicals associated with queens include hormones that are present in – and regulate – her body, and phermones produced by her body that influence other bees. There is a rapid increase of the hormone vitellogen in the blood of a queen as she starts to lay eggs. We know that a newly-emerged queen has a very low level, about seven micrograms, of 9-O-decenoic acid (a primary component of queen substance), while a 10 day old queen will produce about 133 micrograms of the pheromone. In a future article I will review our knowledge of queen chemicals. BC

Dr. Lawrence (Larry) Connor is owner of Wicwas Press, New Haven, CT where he edits and publishes books on bees and beekeeping – LJConnor@aol.com or website www.wicwas.com.

How Well Mated Are Your Queens?

Sue Cobey

Checking old or failing queens should be Number 1 priority for beekeepers, and ABSOLUTELY REQUIRED for queen producers.

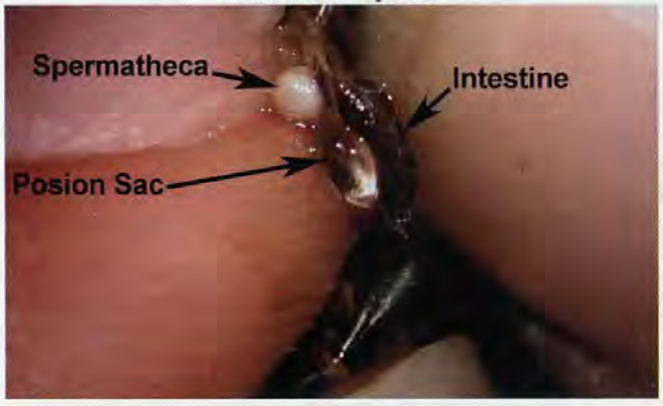
How well mated are your queens? Assessing and knowing the reproductive status of the queens in your colonies is essential to good management. Getting queens properly mated has become increasingly difficult with the impact of parasitic mites. Rearing and maintaining a good supply of mature drones requires strong, healthy, miticide-free colonies.

In the past, a major factor was questionable weather conditions for mating. Drone populations were too often an aspect of queen production that was overlooked. Drones from neighboring hives and feral bee populations were inadvertently used for this purpose. The name we call them, "drone" verses sire or stud, reflects this.

Today, the question is not just the weather There is growing pressure to increase drone populations and assure these are from specific desired lineages. For production queens, this requires drone flooding of mating areas, further increasing the need for larger numbers of drones.

Chemical treatments of colonies and residues in wax are known to be detrimental to developing queens and drones. Several studies have shown this negatively affects their fertility, vigor and longevity. Drones are also more susceptible to pests and disease and the first to be sacrificed when colonies are stressed, weakened or when conditions or resources decline.

In the pulled abdomen, the clear poison sac, spermatheca and intestine are exposed.



Normally, drones have a rate of attrition. From egg to adult, about half survive. When flight begins, their high rate of attrition continues. Colonies will rear drone brood while evicting older, mature drones to ensure their genes are passed on.

Mating is risky; the queen will take one to three mating flights over a period of a few days, mating with 10 to 20 drones. During this small and critical window of time, the weather must be good for flight and a sufficient number of mature drones must be available for mating. The number and genetic origin of drones the queen mates with will determine colony performance.

The queen must store five to six million sperm to fertilize and support a high rate of egg laying over her lifetime. During peak season, she will lay more than her own body weight in eggs, producing an impressive 1500 to 2000 eggs a day.

The Importance Of Reproductive Status

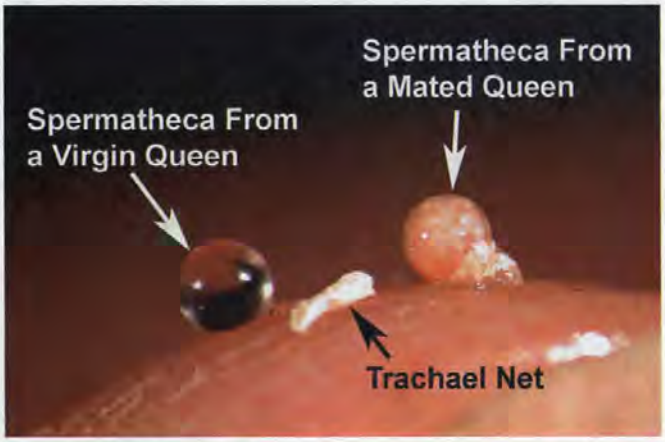
To maintain highly productive colonies with economically valued traits, beekeepers need to know the origin, age and reproductive status of queens in their apiaries. Uncontrolled supersedure of queens often results in a loss of production and desirable colony characteristics.

The uncertainty of a queen's performance potential can be confirmed by a simple field dissection of the spermatheca. Verifying interpretations of colony observations will help to more readily recognize problems and to accurately make evaluations and decisions.

I routinely check the spermathecas of ***old queens when re-queening colonies*** or any queens that do not appear to be at peak performance. This reveals how well queens have mated and indicates how long you can expect them to perform under your conditions and management practices.

Colony assessments and the status of a virgin or failing queen can be easily confirmed. A young queen suspected to have mated poorly should be checked. An unmated or insufficiently mated queen will often lay abnormally. Conditions of the hive must be considered as these signs can also indicate laying workers or

The rough, whitish texture of the spermatheca is due to a covering of tracheal net. This is removed by gently rolling the spermatheca between your fingers.



Comparison of the spermatheca of a virgin and mated queen. Tracheal net coverings have been remove.

inadequate comb space. Recognition of queen condition is increasingly important considering the effects of miticide treatments.

For queen producers, field dissection of the spermatheca is a valuable tool to determine if the supply of drones is adequately mature and sufficient in number for the size of the mating yard established. Recognizing the importance of drone flooding and the benefits of out-crossing are essential.

When weather conditions are questionable, the spermatheca test will reveal if queens have successfully and sufficiently mated. This information helps to determine quality control, enabling more accurate culling of production queens in mating yards.

This simple field dissection of the spermatheca eliminates guessing and can be performed anywhere, without special equipment. Becoming familiar and recognizing the varying degrees of spermatheca coloration and density is something every beekeeper can and should do.

You can diagnose and confirm the status of queens. Recognizing; when a queen is failing, when her egg-laying capacity has declined, why she is unresponsive to the needs of the colony, and if she has superseded, is important. You can identify the unknown status of a suspected virgin or rouge queen.

Good management requires the routine replacement of failing, superseded or lost queens. ***Poor queens never improve.*** Supersedure queens often loose selected traits. Tolerance of this costs time, labor and production loss.

Use this test to become more perceptive of queen performance levels, and to readily predict and remedy problem situations. This is an essential management tool to help maintain uniformly strong apiaries with desired characteristics.

Field Dissection Of the Spermatheca

The spermatheca, the sperm storage organ of the queen, is a spherical, fluid filled organ, over a millimeter in diameter The cell wall consists of a single layer of epithelial cells covered by a net of trachea.

The sperm in the spermatheca is maintained in a state of quiescence with very low metabolism. Special physiological conditions maintain its fertilizing ability. The cell wall of the spermatheca allows the active transport of oxygen and nutrients. Oxygen is supplied by the tracheal net and nutrients are supplied by the spermathecal gland.

Examination of the queen's spermatheca is accomplished by a simple field dissection. The only tools required are your fingers. However, a pair of fine forceps can also be used. To perform this test the queen must be sacrificed. Have replacement queens on hand, as this should be a routine management practice.

The first step is to humanly sacrifice the queen, pinch her head and thorax. With your fingernails or forceps, grasp the queen's last abdominal segment, dorsally and ventrally (top and bottom). Pull the terminal segment apart from the rest of the queen's body.

"Poor Queens Never Improve"

At this stage, you will see the intestine and a large, shapeless, clear poison sac. Among this is a remarkably sturdy, spherical shaped structure, about 1 mm in diameter This is the spermatheca. It is made up of a transparent, chitinous membrane.

Initially the spermatheca will appear whitish and rough in texture. This appearance is due to a covering net of trachea. From this, tease the spermatheca out of the body cavity with your thumbnail.

To remove the tracheal net covering, gently roll the spermatheca between your fingers. The tracheal net will collapse in a small separated white mass, exposing the spermatheca.

Continued on Next Page

The spermatheca of a mated queen is the same color as fresh drone semen. Notice the light and darkish swirl pattern of densely packed sperm.

The cloudy appearance of this spermatheca indicates the queen was poorly mated or has used most of her stored sperm. She is or soon will become a drone layer.

Reading the Spermatheca

The reproductive status of a queen is revealed in the color shade and density of her spermatheca. Experience observing various samples will enable you to recognize these differences. A virgin and a mated queen are readily distinguishable. You can also recognize whether a young queen is well mated or poorly mated and if an older queen's sperm supply has been depleted.

The color or lack of color of the spermatheca is due to the quantity of sperm it contains. The transparent membrane of the spermatheca is apparent in a virgin queen, whose spermatheca is crystal clear

The spermatheca of a well mated queen is the color of drone semen. This is a creamy, *coffee au lait* color with a pattern of light and darkish marbled swirls. The sperm tends to clump in bundles and is densely packed, creating the swirl patterns. A comparison of spermathecas from a virgin and a well mated queen are pictured on the previous page.

A cloudy or milky whitish appearance of the spermatheca indicates an inadequate supply of sperm. The queen was poorly mated or has depleted most of her sperm supply Varying color shades of the spermatheca reveal different densities of stored sperm.

As a general rule, the queen's sperm supply is insufficient if the spermatheca does not show the marbled contrasting color shades. She is or will soon become a drone layer or partial drone layer. Observing the spermathecas of queens in various life stages will enable you to recognize their reproductive status. BC

Sue Cobey is a Queen Breeder, working with the New World Carniolan project, in Columbus, OH.

2 Queener

There is *NO* doubt that a single 2 Queen Colony will out produce 2 individual colonies.

Serge Labesque

Two-queen colonies

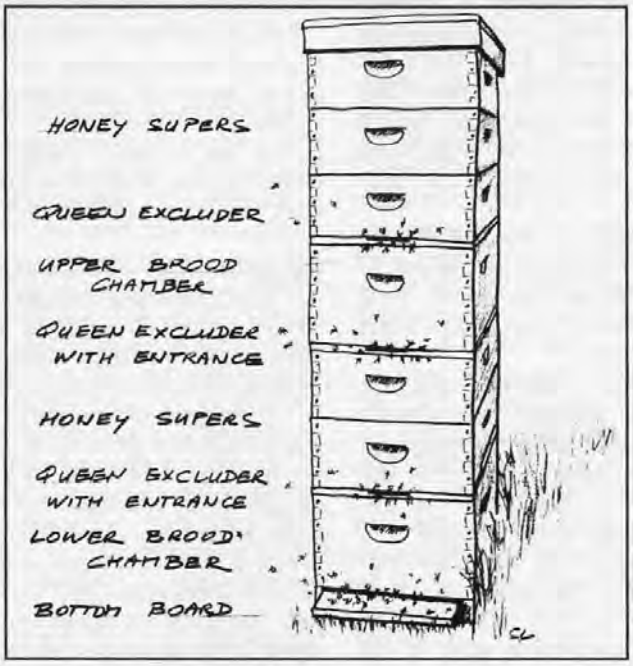
What visions do these three words conjure up in the minds of beekeepers? It may be perilously tall stacks of supers or hive manipulations conducted while balancing oneself on flimsy, unstable ladders. Nightmares follow of back injuries due to lifting heavy boxes above the head, contrasted by dreams of record honey crops. Oftentimes, due to their lack of success in trying this beehive management technique, beekeepers characterize it with adjectives that are not very flattering. And yet, there are others who have become strongly opinionated on this subject, and who swear that these potentially huge contraptions are "fantastic honey factories"

I invite you to take another look at this method of managing colonies of bees. Then you will decide for yourself whether it is something you might want to try.

Fundamentals

In a nutshell, the management of beehives as two-queen colonies seeks to maximize the amount of surplus honey that can be harvested. This technique rests essentially on the tailoring of the bee population to achieve this result.

Of course, what most beekeepers want out of their hives is honey, lots of it! And there is no question that strong, populous colonies can store large amounts of surplus honey at a remarkable speed. There is also no doubt that a single two-queen colony can produce more honey than two separate hives. Call that synergy. But, of course, a good, long honey flow is also a necessary condition, since the bees do not materialize nectar out of thin air Put very simply, this is our starting point: *Masses of foragers, and a good honey flow.*



As beekeepers, we have only a limited amount of control over the quality of the honey flow. If we keep our hives at fixed locations, the honey flow is whatever the weather and the surroundings provide. But, if we can move our hives, we may be able to improve the amount and quality of nectar that is made available to our bees. Sometimes a couple of miles can make a striking difference in the amount of honey that will be harvested, as well as in its quality.

Regardless, given a honey flow, what we may be able to control is the size and the composition of our colonies. What is meant by "composition" in this case, is the relative proportion of foragers to "house bees." The foragers, these somewhat older bees, are the ones that gather the nectars that will be transformed into honey Consequently, we want large numbers of foragers in our hives during the honey flow. In view of this, it's easy to recognize the importance of *the timely and adequate build-up of the bee population, and the predictability of the honey flow.*

Towards the end of the honey flow, we will want to modify the composition of the colonies again, but this time it will be to reduce the wasteful consumption of stored honey. We will no longer want large amounts of brood. These late larvae and young bees that have to be fed will not have the opportunity to become productive foragers anyway.

Our family lives a few miles outside Glen Ellen, a small town in Northern California. The immediate area of rolling hills and native oaks around our house is beautiful, but not a very good location as far as beekeeping is concerned. In a typical year, dry grasses cover the land around us from early May to well into October There are also many acres of commercial vineyards, which are so thoroughly cultivated that not a blade of

Continued on Next Page

A pair of hives of two-queen colonies.

A very simple and handy piece of equipment: *The wood-framed queen excluder with a four-to six-inch notch cut in the front end of it. It is used as a floor and an entrance for the upper brood nest. It also provides direct access to honey supers for the bees, without drilling holes in the sides of the boxes. Because of these additional entrances, the queen excluders are just what their name implies, not "honey excluders." Occasionally, I add two eye screws, one on each side of this entrance to attach a removable landing board. The bees do not need the landing board, but it facilitates the observation of the foragers.*

grass, not a single wildflower is allowed to grow on their frequently clean-tilled soils. Still, I maintain a few colonies at our home. Why do I keep bees around here, in these less than ideal conditions? Just because because I must have bees nearby. I feel the inexplicable need to occasionally walk to the hives, and watch the bees, if only for a few seconds. I get my fill of something intangible, that odd mixture of inner calm and excitement we beekeepers receive from our beehives. A bit of solace.

Despite our six-month dry season, the end of winter and early Spring is wonderful! The grasses are green, and there is a multitude of different wildflowers. That is when we have our honey flow at least most years, in March and April.

Knowing all of this, and what it takes to manage two-queen colonies of bees, you probably are already thinking that this is not a location where beekeepers can benefit from the technique. Indeed, most of the texts you can find on the subject emphasize the importance of honey flows that are "long, intense and predictable." Well, I do run some of my hives as two-queen colonies, regardless of what the books say. Call me stubborn And yet, even in spite of these difficult conditions, I have come to appreciate some of the less-publicized benefits of this method of managing bees, notably *swarm control* and *queen management. The extra honey that is collected and the early reduction of the bee population help carry the hives through our long and dry Summers.*

Horizontally vs. vertically joined hives

There are two main ways of joining the two brood nests: horizontally and vertically In the horizontal configuration, the two brood chambers are placed side-by-side, and the honey supers are added on top of them, in a single stack that is straddling the adjoining walls of the brood chambers. The brood chambers need to be closed. To do this, some beekeepers chose to simply use a hive top that has been sawed in half lengthwise. This allows some limited access to the brood nests without manipulating the honey supers. Horizontally joined hives do not become as tall as those that are vertically joined. Yet, in spite of these advantages, I prefer the vertical configuration, as it has performed better for me, which I attribute to the unrestricted vertical movement of the bees throughout the entire hive.

Establishing two-queen colonies

Early planning and *good timing of the hive manipulations are key elements* in achieving success with two-queen colonies. It is almost like a challenging game of strategy that can bring rewards at harvest time.

There are several ways to bring two separate brood nests together to form a two-queen colony. By following the known procedures for moving hives, we can simply stack an established hive on top of another one. If time and the season allow, another possibility is to divide a hive, introduce a queen in the queenless split, or even create a split that will raise its own queen. Any variation on these methods will work, as long as there is enough time for the population of the hives to grow before the main honey flow. A good procedure to use to get hives on their way to becoming two-queen colonies is the Demaree Method. Not only it is very effective in controlling swarming, but it also generally produces good young queens that we can use at the end of the season to replace the older queens. This is an excellent method if you want to reap the maximum benefits of running two-queen colonies: swarm control, great honey harvest, and queen management. It really is an integrated way of working with bees. So far, none of the hives I have run as two-queen colonies has swarmed. I don't know if this is a strike of good luck, but I am inclined to think that the presence of

the two separate sources of queen pheromones in a hive contributes to stifling the swarming tendency of the bees.

Besides the Demaree Method, which is well-covered in beekeeping literature, or variations on it, I prefer vertically stacking two hives, each in a single brood chamber At that time, the lower one typically has already received a honey super. I let the bees of the upper hive adjust to the new location for a day or so before joining it to the lower one.

Next, a queen excluder is inserted between the brood nest of the lower hive and its super, and a second queen excluder with an entrance is placed between the lower hive and the upper brood chamber. If the season and the location warrant it, a second honey super is also placed between the two brood chambers. Thanks to the buffer space provided by the honey supers, the bees of the two hives will intermingle without fighting.

The honey flow

When the honey flow intensifies, we add a queen excluder with an entrance and a super on top of the upper brood chamber. Additional honey supers may have to be stacked on top of this colony at a steady pace. Unless you have very long, intense honey flows, which is not the case at our home apiary, you do not have to worry about the supers that are between the two brood chambers. You will be getting to them before the honey flow is over, at the time of dismantling the two-queen colony.

Towards the reduction of the bee population

The honey flow is an exciting time, but let's not forget that it will come to an end. Again, we have to call on our prior experience and maybe on our notes to decide when the best time is to split the two-queen colonies. This dismantling of the two-queen colonies needs to be done approximately two to three weeks before the anticipated date of the end of the honey flow. At this point, we have to decide what to do with the two queens and their brood nests. Of course, our long-term plans for the apiary will have an impact on the decision we are about to make, but it is necessary to evaluate the contents of the hives to finalize it.

Basically, we have two options: simply separate the two brood nests or combine them into one hive. It is necessary to assess the quality of both queens to know which one of them we will be retaining, or if both are worth keeping.

On a nice day, we grab our tools and equipment, and go to the hive. If separating the two brood nests is one of our options, we need to take along a bottom board, an inner cover and a top. The bottom board is set next to the two-queen colony, and the top is placed upside-down nearby. As we remove the honey supers, we place them on the hive top. By lifting them, we can already get a feel for what we will be harvesting. Reaching for the upper brood chamber, we place it on the bottom board we brought along. We examine the contents of the frames and especially the brood pattern in order to evaluate the queen. Then, it is time to proceed to the lower brood chamber Once it is reached, we can evaluate the queen it contains in a similar manner. Now we can make our decision. If one of the two queens appears to be failing or is significantly weaker than the other, we can physically remove her, or let the other queen eliminate her for us. But, if we let the two queens fight, there is always a chance that we could lose the better of the two queens. To raise the odds in our favor, we stack the two brood chambers, placing the better queen on top. In most cases, she will overcome the failing queen. Then place the honey supers back on top, and close the hive.

It usually turns out that both queens are good. If our plan is to reduce the number of hives we are managing, now is the time to combine them. Stack the two brood chambers and then the honey supers. The bees will not fight, as they are used to being together, but one of the two queens will be eliminated, which will reduce the amount of brood production, and hence, the future bee population of the hive.

Separating the two hives

If our decision is to keep both queens, we need to split the two-queen colony in such a way as to retain the maximum amount of surplus honey. We also have to prepare both hives to go through the balance of the year. Besides the initial set-up of the two-queen colony, this is probably the most important manipulation. We want to reduce the egg-laying activity of the queens, exploit the honey flow to the end, and secure two healthy hives. One brood chamber will be left at the same location, and the other will be moved, at least a few yards away. The brood chamber that is going to be moved away receives most of the capped brood from the two brood nests, as little as possible uncapped brood and only the young bees that cling to these frames along with one of the two queens. The other brood chamber, which is to be left in place, receives mostly uncapped brood, some frames of honey and pollen, the bees that are easily shaken from the hive that is about to be moved away, and the other queen. A queen excluder with entrance is placed on top of this brood nest, followed by all the honey supers.

Here is what will happen during the next few days: All the foragers of the two-queen colony will keep bringing nectar to this hive, exploiting the honey flow to the end. The queen that is in this brood chamber will have to reduce her egg-laying activity, since the young brood will not be liberating cells for several days, and the frames of stored honey and pollen will limit her range of motion. The hive that has been moved away should have the size of its entrance drastically reduced, as young, non-defensive bees occupy it. For a few days, very few bees will be going out to forage. Without an influx of pollen, the queen will slow down her egg-laying activity. When the young workers start flying out to forage, they will be exploiting the end of the honey flow. The capped brood will emerge very shortly, leaving space in the hive, which will be stocked for the post-honey flow season. By the time the honey flow tapers off, there will be enough guard bees to defend the entrance, which can then be widened.

Next comes harvest time. We extract the surplus honey from the supers, and give the wet frames back to the bees to clean. A super of empty frames should be placed on top of the brood chamber of each hive.

Continued on Next Page

2 QUEEN ... Cont. From Pg. 33

Then comes an inner cover with a hand hole left open, followed by an empty super without frames. The drained wax cappings from the honey extraction process can be placed on top of the inner cover, and the supers containing the wet frames stacked on top of it. The bees will thoroughly clean up the wet frames and the cappings, moving the honey below the inner cover The wax from the cappings will also be cleaned up and re-shaped into remarkable free-form sculptures of the nicest quality wax, sometimes real works of art!

Apart from the local conditions and the quality of the honey flows, the success of two-queen colonies depends directly on good planning and decision-making, and on the timing of the manipulations that influence the bee population. This is a beehive management method that tests the beekeeper's knowledge of the bees and of the environment, but that can also bring a variety of rewards and genuine satisfaction.

So, is this something you might want to try? BC

Serge Labesque is a sideline beekeeper and inventor.

A CHILLING EFFECT ON BEEKEEPING

Global Warming, Beekeeping, and Unexpected Outcomes

Jim Fischer

By now, most of you are in the midst of a Spring nectar flow or preparing for one. Lots of us waded through snow back in February and early March, feeding colonies, sliding pollen patties into hives, and otherwise trying to get some serious brood rearing started.

After a day working hives in snow, any beekeeper might be tempted to think that a little global warming might not be such a bad idea.

But they'd be wrong.

Before we go any further, I guess I should explain why you keep hearing the term "debate" in regard to global warming. The only debate among reputable scientists is about the specific negative impacts that are resulting and will result from global warming. If you read newspapers rather than scientific journals, you are subjected to the distortion of "journalists" who have problems differentiating between carbon monoxide and carbon dioxide, yet presume to provide "objective balance" on issues that they can't be bothered to learn about themselves. In this case, "objective balance" becomes the amusing notion that viewers and readers are entitled to "both sides" of any issue, without any mention that one "side" is being presented by a tiny number of paid shills.

The result is that one person interviewed represents 99.97% of the scientific community, who have a firm consensus that global warming is not only being caused by human activities, but also agree that it is a serious issue. The other person interviewed represents the tiny number of scientists in the employ of the worst of the air polluters.

If you look carefully, you will notice that the scientist claiming that global warming is either not happening at all or is not being caused by heavy industry wears a lab coat that is slightly too large. This is to hide the unsightly bulges of the wads of cash stuffed into his pockets by polluters to entice him to make himself a laughingstock among his peers.

But it just isn't funny.

And beekeeping will suffer badly from global warming.

But not in the way you might think.

GLOBAL WARMING, COLDER CLIMATE

Climate models indicate that global warming can cause a localized "mini-ice age" of sorts, with ripple effects that would make beekeeping more difficult in some places, and impossible in others. It could happen within the next few decades, and last for generations. It has happened before, and samples of ocean water temperature and salinity continue to indicate that it could happen soon, suddenly, and without much warning.

In 2002, the National Academy of Sciences published a report that they titled "Abrupt Climate Change: Inevitable Surprises." You can read the entire report online at www.nap.edu/books. Scroll down to 0309074347/html. The NAS is not some fringe group of tree-huggers. The NAS is the "science advisor to the nation," and scientists who are asked to contribute to the efforts of the NAS serve without pay to address critical national issues and give advice to the federal government and the public. The title of their report alone should make clear just how universal the acknowledgement of global warming as a serious and negative force is among qualified experts.

In short, the report says that ongoing global warming is certain to break something beyond repair, and while no one can predict the exact outcome, every climate model described as "sophisticated" shows sudden and negative impact resulting from the gradual warming resulting from current forms of industrial activity. "Sudden" as in "without warning." "Negative" as in "massive crop failures."

HOT NEWS

But one need not be a specialist to notice that strange things are happening. One need only read the newspaper Global warming has been melting ice from glaciers and from the polar regions for the past few decades. Recent reports of major tangible events have included:

In 2002, a 2123 square mile piece of the Thwaites Glacier in Antarctica broke away and floated into the Amundsen Sea, earning the name "Iceberg B-22." To get a sense of how large this hunk of ice really is, the state of Delaware covers about 2500 square miles.

Also in 2002, a 1254 square mile chunk of ice broke off the "Larsen B" ice shelf on the Antarctic Peninsula.

In September of 2003, the "Ward Hunt" Ice Shelf, the largest in the Arctic covering an area about as large as all of Chicago, Illinois, cracked in two, prompting scientists to punch a few numbers into pocket calculators and conclude that in as little as a decade,

Continued on Next Page

GLOBAL ... Cont. From Pg. 35

man's production of excess CO_2 will create a navigable open-water "Northwest Passage" between Greenland and the Bering Straits of Alaska every Summer.

- At current melting rates, the US Park Service says that by the year 2030 there will be no glaciers in Montana's Glacier National Park.

You are likely wondering how melting polar ice caps could cause a "mini ice-age." The answer lies in the fact that ice is frozen *fresh* water, and melting ice decreases the local salinity (saltiness) of ocean salt water in a few key places.

One of those key places is in the North Atlantic, where both water temperature and salinity data have been recorded for years, and significant changes have alarmed the scientists who study such things.

WHAT GOES AROUND, COMES AROUND

The world map is a simplified diagram of the "Global Ocean Conveyor." While North Americans know of the "Gulf Stream," few know that it is merely one short segment of a worldwide ocean circulation pattern. The amount of water flowing in this current past any one point at any one time is roughly equal to the average of all the rain that falls on the planet, 15 million cubic meters per second.

In the tropics, this current is warmed. It carries this warmth along the east coast of the U.S., and into the North Sea. The impact of this warmth is enough to allow the British to enjoy days at the beach at the same latitude where, in Canada, polar bears are the only ones enjoying a swim in the ocean.

When the current reaches the northern Atlantic, it cools enough to make the water more dense.

The colder water is heavier than the surrounding water, and sinks into the deep sea, then following a southward path, continuing around the planet-wide loop.

But temperature alone is not enough to move all that water. Salinity is also a significant factor in the process. The denser water has a higher salinity, since as water density increases, there is more salt in any one cubic foot of water.

If the water were less salty, it would be less dense and would not sink at the temperatures found in this area.

The salinity of both surface waters and deep ocean waters in this area have been measured since the 1900s as a part of the ongoing monitoring of fishing stocks. Until the 1970s the salinity had been almost constant. But it began to drop. The drop-off in salinity indicated that the flow of the ocean conveyor had been reduced by 20%.

The salinity had been diluted by massive amounts of fresh water from melting ice. Siberian rivers are pumping out more fresh water at a volume equivalent to three Mississippi rivers. Arctic ice is melting, and the glaciers in Greenland are also melting. All of this fresh water directly dilutes the salinity of the water in the North Atlantic. Melting of Antarctic ice appears to have less direct impact, but is also considered to be a diluting factor for the deep-sea flow that passes Antarctica.

Continued warming and melting would, at some point, tip the balance and halt the flow of the water.

The impact on Europe would be significant. Beekeeping would become nearly impossible, but this would be among the least of the problems that they would face. Britain would likely be more concerned about having snow on the ground for 30 to 100 days per year and Wintertime lows in the -20°F range.

But the impact would not be limited to Europe. Central America would likely lose up to 40% of its rainfall. The best computer models available suggest that vegetation making up the rainforests would die and be replaced by grassland. The rainfall currently falling on the tropics would fall further south. The Asian monsoons would weaken or fail for many locations. Agriculture in Asia depends on regular heavy monsoon rains. Merely "weak" monsoons would produce famine and economic collapse.

THIS HAPPENED BEFORE, NOT LONG AGO

Scientists who study "paleoclimitology" (the climate, long ago) drill deep into glaciers to capture and analyze pollen, dust, and air bubbles trapped in the ice at various levels. They drill into the sea floor, and look at calcium carbonate levels in the remains of sea shells. They hunt for long-submerged tree trunks preserved in bogs and deep lakes, and look at the tree rings. All of the data clearly indicate that an event that happened about 12,000 years ago, the "Younger Dryas Event," was likely triggered by a shutdown of the Global Ocean Conveyor.

The conditions now are very different from those that preceded the Younger Dryas. The Younger Dryas happened as the Earth was coming out of a major ice age. While we should not expect advancing glaciers to cover locations currently occupied by major European cities as they did in the Younger Dryas, we can expect several changes, starting with an average temperature drop of about 6°C in the North Atlantic, and 4°C just about everywhere else.

THE ICE MAN COMETH?

The transition from warm to frigid can happen in as little as a decade or two. While no one is exactly sure just how much warmer and how less salty the seawater near Greenland can be before the Global Ocean Conveyor simply stops, hard data indicates that the flow of water is clearly slowing down.

No existing atmospheric computer model can accurately predict the exact sequence of events that might follow such an abrupt change. However, as happened in each of the abrupt changes recorded in glaciers worldwide, if the conveyor were to shut down, the worldwide climate would likely "thrash" for several decades before settling into its new colder, dryer state. The consequences to agricultural production of each these "thrashes" would be devastating.

If allowed to continue to accelerate, global warming could, in our lifetime, result in scenes like the one now outside my window becoming much more common, rather than less.

So, should beekeepers be concerned about the environment and issues like global warming?

Only if we want to continue keeping bees. BC

Follow Through From The AHPA MEETING - NHB & PESTICIDES

Kim Flottum

More than mites, small hive beetles and resistant queens were covered at the Honey Producer's meeting in January. Two very different and very important topics were covered that bear attention – The National Honey Board's (NHB) honey use and marketing study was first; then a very sobering report on the continuing conflict between pesticide use, and abuse, and honey bees, by Jeff Anderson.

Since these initial reports we've added to the information with data from the Honey Board's huge survey taken recently, and the results of Anderson's appeal case against the State of Minnesota, Department of Natural Resources, an aviation company and the International paper Company.

The NHB opened with an explanation of why the European Union recently banned imports of U.S. honey. The E.U. became concerned when contaminated honey was discovered in the U.S. That this was imported honey made no difference it seems, and to allow imports, the E.U. wanted all honey tested for a variety of contaminants before exported. They felt the monitoring being done by FDA was insufficient to find problems.

The FDA countered that the risk was extremely low and that such a large program would not be necessary The E.U apparently didn't care and imposed the ban. No U.S. honey to the E.U.

The FDA countered that they simply didn't have funds to impose such extensive oversight and it simply couldn't be done.

Too bad was the answer. So, at least in January, the situation was a stand off. Reaction from the honey industry has been less than strenuous so far. Those exporters directly affected, certainly, are lobbying for either a relaxed approach from the E.U., the acceptance of inspection other than the FDA, or to have the FDA begin oversight.

Meanwhile, U.S. packers are stepping up their own inspections, or at least the largest operations are. Testing for a variety of contaminants is becoming more routine – especially for imported products. Closing the barn door after the horse is out is a Generally Accepted Practice in too many food safety situations, it seems.

Ultra filtered honey, or as it has been renamed, sweeteners derived from honey haven't gone away by any stretch either Interestingly, the filtering process does not remove the contaminant it was meant to – the antibiotic Chloramphenicol. It does remove enzymes, proteins, pollen and any microorganisms that may be present, along with anything approaching flavor. A new, sophisticated testing process is very accurate in identifying UF honey, even to the point of being able to ID UF and regular honey blends. Maybe you can fool Mother Nature, but not good science it seems.

Elsewhere we have the USDA's 2003 Honey Report showing U.S. production last year. Production was up a bit last year, adding to the supply. Along with that there has been a tidal wave of foreign honey in recent months coming in at prices less than U.S. honey is selling for.

All this honey has to go somewhere and waiting in warehouses seems the place. Right now most beekeepers are flat out empty since many had short crops due to weather, and sold early to capture attractive prices.

Nevertheless, there are nuggets of gold in the NHB's huge attitude and use survey that you can use. Following are some sobering, and enlightening results.

- 80% have honey in their home.
- Only 27% purchased honey in the past year (the survey was taken in 2002, and published in 2003).
- 8% have never purchased honey.
- Sticky and messy are the main reasons for not buying honey – a good dispensing container is important.
- Breakfast is when honey is used most.
- Honey use remained the same from the previous year, on average.
- Younger respondents and those with more education consume more honey.
- Containing antioxidants and fighting heart disease are persuasive when buying honey.
- Organic honey has a very positive image and should be stressed.
- Current users garden (64%), and gourmet cooking (42%).
- Point of sale and on-pack information should be used to pass along information on stickiness and messy problems.
- Alternate flavors should be stressed (varietal honeys).
- Recipes would increase use, especially BBQ recipes.
- Cold and flu remedies should be stressed.
- People under 45, college educated, children at home users are on the increase as honey users.
- The current user is 48 years old; Caucasian; grills; practices

Continued on Next Page

FOLLOW ... Cont. From Pg. 59

physical fitness; travels; uses computers; travels, and gardens. Household income is $55,200 and is college educated.

- Reasons people don't use honey – Taste, don't cook, didn't grow up with it, and don't like the texture. Taste is *the* primary reason people don't use honey.
- Interestingly, taste is the primary reason those who use honey purchase it.
- Current uses of honey – on toast, biscuits and muffins; in cooking; in tea and as a sore throat remedy.
- More men eat honey than women, children under 12 and teenagers.
- Currently in the home: sugar – 93%; brown sugar 78%; molasses 32%; artificial sweetener 43%; maple syrup 67%; honey 78%.

This is a *very* brief overview of a *very* comprehensive survey, but even these nuggets should steer you in directions for marketing your honey. For more information check out their web page at www.nhb.org.

•

January, 2003 we published an article by Tim and Jan King on troubles beekeepers in Minnesota were having with pesticide sprays on hybrid poplars grown for pulp. Flowering weeds grow in and around the the poplar orchards even though some effort was made to remove them with herbicides and cultivation. Cottonwood Leaf Beetles (CLB) moved into the tree monoculture and caused, according to the Minnesota Department of Natural Resources (DNR), economic injury.

To prevent damage to the trees from CLB the DNR ordered pesticide applications, using Sevin XLR. Applications were made by a local contractor trained to perform the work. DNR selected the chemicals and rates of application. BT was used on occasion.

You can guess what happened. Bees on blooming plants in and near the spray area were killed. Moreover, once the Sevin XLR dried, bees visiting sprayed flowers took home and stored contaminated pollen, and it killed bees later in the season.

Jeff Anderson, who spoke at the Honey Producer's meeting had much to say about the process of finding a solution. He had taken the MN DNR, the MN Ag Dept., the land owner (International paper) and the sprayer to court claiming label violations in application, negligent action, liability of contractors, and nuisance claims. He lost the first round, that is according to the court – the DNR and IP did not violate the label; they were not negligent because they did not wantonly destroy bees; but they did find the DNR liable of injuries because they hired a sprayer with an out-of-date license.

Anderson appealed, and you'll see why in a bit. While the case was being reviewed he spoke at the Honey Producer's meeting; detailing the situation, but more importantly, the relationship of the EPA, the MN DNR and Dept. of Ag, the meaning of words on a label, the difference between mandatory and advisory and who in the EPA to contact when you have a complaint.

Shortly after the meeting the finding of the Appeals court came down. Here is a summary of the finding:

Anderson argued that the label stated Sevin XLR couldn't be sprayed if bees are 'visiting' the spray area. The state ruled that the label says that visiting and foraging are not the same. EPA said foraging means 'actively visiting,' not just 'visiting.'

Further, the court found that federal and state law gave MDA authority to investigate and enforce pesticide activities, and, that agency decisions are presumed correct. Period.

Specifically, the court ruled that the bee caution on the label only prohibited spraying Sevin when a *significant* number of bees were *actively* foraging in an area with a *significant* number of blooming flowers. To do otherwise would prohibit all applications during the season. Anderson did not prove, according to the court, that *his* bees were actively foraging in the area – thus no label violation. Pictures, videos and witnesses, said the court, could have proved otherwise.

To prove negligence you need to show; 1) a duty of care existed; 2) duty was breached; 3)injury was sustained; and 4) breach of duty caused the injury. The court ruled that bees are not trespassers (owner has no power to prevent entering) and a landowner does not have duty of care. No duty, no label violation – no negligence. Further, since the sprayer was trained and the job not ultrahazardous, the general rule applies that an employer of an independent contractor is *not* liable for the harm caused by the contractor. For the DNR, then, no harm, no foul, no fault.

Nuisance – anything that interferes with the use and enjoyment of the *land*. Ownership of land involves the right to the unimpaired condition of the property, and some reasonable comfort and convenience in its occupation. Land is the key. Anderson's bees aren't 'land.' 'Land' wasn't injured. No nuisance, said the court.

All of this hinges on the interpretation of the label, of course. Visiting, actively visiting, foraging, significant number of bees and flowers.

To their credit EPA has resisted efforts by pest control organizations to loosen even further bee protection warnings on pesticide labels recently due to pressure by environmental groups and the bee industry. But, according to Jeff Anderson at the meeting, states are making and enforcing their own regulations without enough oversight by EPA. Only continued contact with EPA will protect what cautions exist. Increasing EPA's oversight is a goal the bee industry should be rigorously pursuing.

The lessons here are simple, but important. Document everything with photos, videos and witnesses. Contact the appropriate Ag Department authorities and the EPA when reporting alleged violations. Insist on expedient inspections and reports. Keep in contact with EPA officials.

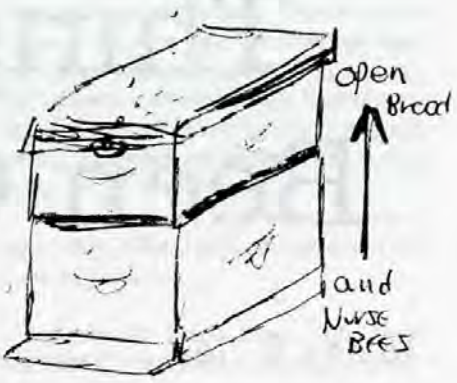
Most of all, know the law. They're your bees. It's your business. And learn from Jeff Anderson's experience. BC

For the complete transcript: www.courts.state.mn.us opinions of the 17th of Feb A03-679.

OVERNIGHT SPLITS

It doesn't get any easier than this

Michael Palmer



Recently, a hobby beekeeper from California posted a sad tale on one of the chat lines about his attempt to make a nuc from his strong, over-wintered colony He removed brood and bees from the parent, all the while looking for the queen. Well, the queen was not to be found. The nuc was moved to a new stand. On the following morning he returned to the apiary to check on his work. He found the parent colony agitated and roaring loudly. They were queenless, having had their queen transferred to the nuc.

How many times has this happened to you? You try not to take the queen when making nucs or transferring brood to weak colonies, but since you didn't actually see the queen you aren't quite sure where she is.

Did you get apprehensive, worried, and maybe even sick to your stomach, about what you did to your bees? Did you actually make the parent queenless and lose your expensive store bought queen because the now queenright nuc refused to accept her? Maybe you even put off performing the manipulation because you were afraid of "messing up" your bees.

I did. I was a hobby beekeeper once, too. I remember the feelings well.

Too often, hobby beekeepers are confused by all the various complicated methods they are confronted by It is said that for every two beekeepers, there are three opinions to every question. Seems that way, doesn't it?

I've spent the last thirty years trying to eliminate the guesswork in my beekeeping. This was, in part, an attempt to train unexperienced help, so they could learn to do the job required, without years of training. One of the best examples of this was shown to me by John McDonald, a commercial beekeeper from New York State.

Making up nuclei from existing colonies need not be a confusing and stressful time. It also doesn't have to require much time and patience as you try to find the old queen. All that is really needed is a queen excluder

The first step is the identification of the colony to be divided. I only split the strongest colonies...those with eight to ten or more frames of brood at Dandelion bloom. In my area of Northern Vermont dividing weaker colonies, or dividing them after Dandelion bloom, usually results in major loss of honey crop.

Here's how I do it. Place an upside down outer cover and empty hive body on the ground next to the hive to be split . . . here called the parent. Open the parent colony, and remove three frames of brood, two of sealed, and one of open brood (larvae). Shake all the bees off these frames of brood back into the parent. Place the now bee-less brood into the middle of the empty hive body. The *open* brood should be one of the outside combs of the three.

Remove a nice pollen comb from the parent, shake off the bees, and place it next to the open brood...isn't this the way the bees would do it? On the other side of the sealed brood place a comb of honey, removed and shaken, from the parent. These five combs are the beginning of your new colony. Add four more combs to the nuc, to fill the empty spaces, and place the inner cover on top. Any brood remaining in the parent colony box should be moved to the center, and empty combs given on each side. Then put the excluder on top of the bottom box (the parent) and the new box on top of the excluder. Inner cover, cover and you're done.

Overnight the bees travel through the excluder, to repopulate the brood.

The old queen remains below the excluder The following morning the nuc is removed to a new stand and given a laying queen or a ripe cell. The bees have populated the nuc the way "they" want. The open brood attracts ample nurse bees to care for it. The population of young bees is high in the nuc...most old bees fly back to the parent when the nuc is moved to a new stand...and the new queen is readily accepted.

A variation of the above can be used for requeening a colony or creating a two queen colony. Instead of five frames of brood being taken from the parent, the whole top hive body is used as the nuc. The next day it is removed from the excluder and located above the parent's solid escape hole closed...inner cover. The nuc's entrance...that notch in the inner cover or an auger hole...is located to the rear of the hive.

The new queen is brought into a laying condition in the nuc. For a time the colony benefits from two laying queens . . just what a weaker colony needs anyway. In three weeks time, go below and kill the old queen and unite the two units with newspaper. If the new queen has failed to take you have a second chance to requeen since the old queen is still laying below. If it is a two queen set-up you want, you only need arrange the bodies as required. Both queens are already laying.

I have used an excluder for making up my nucs thousands of times over the years. It truly eliminates the guesswork in a most important facet of beekeeping. BC

Michael Palmer is a commercial beekeeper from St. Albans, VT. He makes his living in the fields and meadows of the northern Champlain Valley.

Things That Have Been On Your Mind

James E Tew

From you

A great number of you have contacted me recently, in all kinds of ways – emails, regular mail, photos and occasional phone calls. If I have not responded, I apologize and I will work to get better, but though no fault of mine (which is rare) my email software program lost 125 messages while I was on a recent week-long trip. I don't have a clue what was in those messages. They are simply gone. Poof!

The New England Hive

In the February, 2004 issue, I wrote a painfully detailed article describing the mystery of the design of *"The New England Hive"* Previously, when I've asked you for help you've never let me down. But this time I appear to have stumped everybody. While a good number of people wrote who could competently read the prints, no one seemed to know anything about the hive design or its history. So the mystery continues.

Sonny, from Maine

Sonny, thanks for the nice letter you sent to me last November, 2003 telling me how much Richard Taylor had meant to him and how sorry he was that we didn't have Dr Taylor any more. He also went on to briefly describe his history in Maine beekeeping. But Sonny, you didn't include your last name or a return address. I'm dead in the water without some kind of return information.

Allen from Colorado

Allen, thanks for the excellent note describing feeding and manipulating weaker colonies in Colorado. I've taken the liberty of telling everyone else some of what you told me.

I've known for years that some beekeepers successfully overwinter nucs in temperate climates by "bundling" over full-sized colonies and I wondered if that also applies to unusually small clusters, covering four frames or less going into Winter.

Where we are here in central Colorado (about 60 miles north of Denver) our Winters are cold, -20°F at times, but usually interspersed with good flying weather, 50°F in several two to three week intervals. As a result, I've found that we don't really need to wrap our colonies. It helps a little, but the advantages don't seem to justify the extra labor involved, at least from my own experience. I've been keeping colonies in this area of Colorado for about 20 years. What really does matter, I've found, is having plenty *of honey and pollen stores, about 90 lbs. total, for a full-sized colony going into Winter.*

Since the mites came into this area, about 15 years ago for Tracheal and about 12 years ago for Varroa, *Winter mortality has skyrocketed, though it's tapering off from about 60%*

70% Winter kill to about 25-30% in recent years. As a result we've wanted to focus more on bringing weak colonies through Winter largely through supplemental feeding. I agree with you that the only type of feeder that works effectively is a larger capacity, in-hive type. We use several variations on the Miller type using warm 1-1/2 to 1 sugar syrup. Two to one gets too viscous in colder weather. High fructose corn syrup works well too, but is difficult to get in smaller quantities here. We have to feed small amounts of about a quart or two at regular intervals of about once or twice a week. Having the syrup at 55-90°F gives the bees a chance to take some down before chilling off too much, depending on outside temperatures.

Brad from Indiana says

I am in Muncie Indiana and have around 45 hives with a similar feeding crisis after a rainy Summer and Fall. I have had six starve out. I started feeding 8oz water/ five lbs sugar paste the last three weeks working well so far. I took 2" thick Styrofoam blocks cut the same size as inner cover and cut out a 12" diameter hole in center. I put the block between inner cover and lid and pack around seven lbs. of this sugar paste in the hole. I have been feeding them about one time a week. About 50-100 bees are up in the cavity chewing the sugar on 20 degree days. The insulated cavity appears to be working great. I have several light colonies that would most likely die without the feeding.

On this feeding subject

As you probably know I have been writing about feeding starving nucleus colonies that were returned to me late last Fall from

Continued on Next Page

ON YOUR MIND ... Cont. From Pg. 37

cage-pollination studies. They were clearly going to starve in the Winter. I fed them commercial fondant that was costing me about $50 for 50 pounds. To date, I have feed nearly three cases of the stuff (or spent about $150 on sugar feed.)

I would love to tell you that the results are positive, but they absolutely are not. Right now in mid-February, of the 35 of which I started the Winter, five (yes, five) are still alive. In my defense, this is not surprising but I had to try something.

In addition to the comments posted above from you, these are observations I have made while trying to Winter feed small colonies.

1. Winter feeding is a cold, lonely job. One that is easy to put off.
2. Money and time requirements add up.
3. The hungry hives need the temperature to be around 40°F or they will readily fly from the colony when being fed.
4. Some colonies seem to be something approaching stupid. They move their cluster away from the feeding source and the cold weather traps them there.
5. About one pound of fondant will feed a nucleus hive for about six to eight days.
6. The occasional warm day is a pain. Bees leave the hive and fly about the room in which I am holding them. Strangely, the weak colony seems better off never having a particularly warm day.
7. Many of the colonies that have died showed signs of dysentery. Was their death hastened by the sugar fondant I was feeding? I don't know, but I don't think so. The five surviving colonies show no signs of intestinal distress.
8. Prepare the fondant for feeding ***before*** getting to the hives. It will be cold and messy job. Having the feed pre-prepared makes the unpleasant job go a little faster.

Bottom line? As has been reported time and again in the extensive bee literature – take your Winter losses in the Fall. If I am ever confronted with this situation again, I plan to try removing the queens to small cages and attempt to feed them though the Winter. (They will still probably die.) I will combine the bees from the remainder of the colonies into larger queen-right colonies and will feed them as a few large units rather than many small ones. Many of my nucs have died simply because they were so small and the weather got very cold. But if possible, I don't plan to ever be in this situation again.

From Brent in Michigan

Brent wrote me describing his operation and had a few comments about how he is trying to get others into beekeeping.

I work at the Donald C. Cook nuclear station in Bridgman Michigan. And I can say that all the guys in my crew know a lot more about honey bees than they ever thought they would, and a couple of them want to take up the hobby as well. I never miss and opportunity to pass on everything I have learned to the people around me, and let people know that all insects that sting are not bad. And without honey bees a lot of us would go hungry.

William from Yahoo

William had several good questions. I have attached one for your review. I don't think I have ever been asked this before.

Are you aware of any research on the pros and cons of using distilled water to prepared sugar syrup to feed honey bees? Will it retard or eliminate fermentation?

From J. Tew. *William, distilled water will not have much effect on retarding fermentation. Won't hurt, but it won't help very much either.*

John from Orcasonline

I am a hobby beekeeper of 15 years. Today I began taking off honey from my four hives. Much to my surprise I found no honey but masses of bees and sealed larvae. There are no eggs at this time, but I have never seen two deep and four shallow supers so full of bees and brood. We had a very dry and warm Summer and a good crop of blackberries for the main honey flow.

Usually with this mix I make a good crop. What might the problem be! I am at a loss.

From J. Tew. *John, right from the start, I don't know what your problem was. With so many bees in your hive, you didn't have a disease, queen, or swarming problem so I would think it was nectar related. I suppose the absence of eggs would indicate that the queen had shut down, probably in response to the honey shortage.*

Fred from Alabama

Fred sent me his observations on the West Small Hive Beetle Trap. He noted that:

1. *There was some breakage on the plastic cover in shipping.*
2. *There are not enough predrilled holes in the spacers.*
3. *The trap does not properly fit on plastic bottom boards.*
4. *When installed, there is no way to use a Boardman feeder.*
5. *The bottom board should be scraped clean and a spirit level used to level the bottom board to keep oil from puddling to one side.*

However, after dealing with these problems, he recommends using the traps.

Thank you

Thanks to all of you who communicated with me in recent months. I've missed answering some of my mail over the past few months. Nothing intentional, and if you are one those I missed I apologize. I will try harder. BC

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684; Tew.1@osu.edu; www2.oardc.ohio-state.edu/agnic/bee/; www2.oardc.ohio-state.edu/beelab/

Children And Honey Bees

Presentations For Schools & Groups

Kim Lehman

This is the third of four articles on presenting programs to children about honey bees.

Many of you go into schools to present bee programs for children. Hopefully there are some new ideas and points of view in this article to help you in your work. If you have not ventured out to talk to groups of children, you may want to consider taking on this fun challenge. I know that some people may run screaming for mercy if confronted with a group of 5-year-olds. I, myself, gulp when I address a group of insecure, hormone-raging, tattooed teenagers. I make myself do it because I know that with every experience I learn more about this mysterious group. In this way I have an opportunity to develop a greater understanding of teenagers therefore enriching my life as a human being. Children give us the opportunity to embrace and appreciate youth. Take a chance.

Where Do You Find Kids?

The obvious place to talk with groups of children about bees is at a school. But it doesn't end there. Other places I have presented programs about honey bees include: child care centers, home school groups, public libraries, Sunday Schools, Bible Schools, scout meetings, after school child care, parks and recreation programs, and birthday parties as well as public and private schools.

Networking: Getting the Word Out

It all starts with letting people in your community know who you are and what you do. Talking to a teacher or phoning a school can do this. When calling a school, ask to speak to the person in charge of programming as the starting point. This is often the assistant principal. Almost every kindergarten teacher does a unit on insects. This is probably one of the biggest groups I get calls for. Once your name gets out you will start getting calls. It's nice to have names of other people interested in speaking to groups to refer to for help. Our local bee organization has a list of people who are interested in doing presentations and collecting wild swarms two of our most sought after community services along with people looking for local honey.

Setting It All Up

There are some important questions to ask when planning and setting up the logistics for a group presentation. You need to know the ages of the children, size of the group, how many presentations, length of presentations, location (classroom, outside, cafeteria...), and don't forget a contact name and number The larger the group the more demanding the presentation. If you charge a fee, let people know up front. More about fees later

So everything is arranged. The day of your presentation arrives. Think of the presentation as having five parts: preparing the audience, an introduction to hook them in, the actual presentation, question and answers, and the conclusion.

Continued on Next Page

CHILDREN ... Cont. From Pg. 43

Preparing the Audience

When setting up for your presentation, avoid distractions by having your back to a wall. A window, door or other source of visual activity behind you can cause interruptions and difficulty in maintaining the children's attention. You want to have as much in your favor from the beginning as possible. The space is ready.

Now the children enter the picture. One of the most important things to assure a successful presentation is to prepare the children to listen. This may be done by the teacher or by all means, do it yourself. Getting off to a good start is half the battle.

With younger children short, simple reminders work well. The most common are: "sit flat on the floor so everyone can see", "keep your hands to yourself", and "put your listening ears on." Most important of all is to let them know you are glad to be there and that you want them to learn and have fun in the process.

One thing that always arises is how to handle raised hands and questions. Once the hand raising starts it can be very disruptive, especially with younger groups. A raised hand doesn't necessarily mean a question will come out. Instead you may hear a comment like, "I got stung once", "I like your shoes", or "my dog died." Generally speaking, I recommend heading those waving hands off at the pass by letting children know up front that there will be time for questions at the end.

The Hook: Begin with a Bang

After going over a few of the ground rules, give the children a very clear sign that the actual program has started. A very effective beginning is singing a little song. Before you frantically say "But, but, but I can't sing," let me make one thing clear I'm not talking about an opera or a Grammy award-winning solo. Children are very forgiving when it comes to music. A song can get their attention, let them know it's time to listen and assure them that something fun and interesting is about to happen all at once! Just take a tune you already know and change the words. The tune Mary had a Little Lamb can become... "Once there was a little bee, little bee, little bee. Once there was a little bee that landed on my knee." You get the picture. Add a little puppet and you are set to go! Which leads us to another effective opening. Puppets. Children absolutely love puppets! You could have a puppet introduce you, or talk about her life in the hive. The only limit is your imagination and willingness to play.

With older children you may want to get their attention by using your words. "I'm a beekeeper I have to get stung every few months to stay healthy." The children will be all eyes and ears. "What next?" will be the main thing on their minds.

The Presentation: Technique and Content

There are some simple things to remember when speaking to a group. First, talk loud and clear enough for all to hear Second, remember to slow down. Often when people are nervous, their speaking voice goes into overdrive. Eye contact is helpful in keeping children involved. You can also use eye contact as a discipline tool and as a way to spot potential trouble before it happens. Props are great to have but be prepared and organized. Even a few seconds of fumbling with props may lead to wiggling and jiggling, especially with younger children. Anytime you lose their attention it takes time and energy to get them back.

In your presentations, you may want to include information about bee biology, bee behavior, pollination, products of the hive and beekeeping. Younger children can grasp more information than you may think. Keep material simple but avoid talking down to them. Older children will be interested in more detailed information, especially about bee biology and behavior

In your planning and preparation it is important to choose age appropriate material and information. You can tell something is not age appropriate for the younger ones if they just can't stay with you. The older ones will roll their eyes or make obvious gestures if your material is a bit too young for them. They are not subtle. They will tell you what they think!

As you gain more experience you can learn to read the audience for signs of fatigue, disinterest or overwhelming enthusiasm. Then you can adjust your presentation accordingly. Experience is a great teacher

Keep programs for younger children somewhere between 20 – 30 minutes.

Older children can go from 30 – 50 minutes.

Useful Tools

Honey Bee Study Prints

These poster-size photos of real bees provide a wonderful visual aid to accompany your presentation. Each poster has printed information on the back. Teachers will often ask where they can get a copy for their classroom. To order check the Bee Supply catalogs or the journal ads.

Audience participation

Getting children actively involved in learning is always beneficial as long as they don't get too involved and run down the hall to find more flowers. One very simple idea is to have a child try on a beekeeping suit and veil in front of the class. Another activity is to have the children pretend to be a bee. Prepare children for this activity by having them put on their three body

parts, six legs, two antennas, two compound eyes, three sensors, two wings on the left and two wings on the right. Fly from flower to flower drinking nectar and picking up pollen. Do the circle dance and the waggle dance to let the other bees know where the nectar is. You could also have the children pretend to be a flower that a bee puppet pollinates. Louann Hausner 1996 American Honey Princess, has the children act out all the tasks of the worker bees.

Props to Bring

Some things you may want to include in your bag of tricks: an observation hive, super, frames, hive tool, smoker, bee suits and veils, wax, honey from different floral sources, pollen, propolis, wax candles...

Read a book

Depending on the size of the group a book can be a great way to transfer information. When reading hold up the book for all to see the pictures, which means learning to read sideways or upside down. Be very familiar with the book.

Questions and Answers

When talking to older children give them an opportunity to think and ask questions. Use this time as a way to encourage curiosity and learning. Asking questions is one of the best ways to learn.

Instead of asking for questions with younger children I may say, "Does anyone have a what, why or how?" This heads off some of the stories that arise. Sometimes I will call on a child with a hand raised by saying, "What is your what, why or how." After a thoughtful moment, they will begin with, "What..." Voila! A question is formed!

The Clear Conclusion

Whether it is a presentation for adults or children, it is important to have a distinct end to your program. Sometimes when questions are being asked, restlessness sets in. People may begin to leave. It is easy to have a program peter out rather than truly end. When you see this happening use your body, voice and words to provide a distinct conclusion. Walk forward, speak clearly, make a few closing comments, and let them know the program is over and that you can continue to answer questions afterwards.

Once again a puppet can be used to accomplish this. A puppet helps to quiet kids down, allows you to go over some review points, and brings the focus back to say goodbye after the hubbub of questions. If you feel comfortable with the idea, invite listeners to contact you with other questions they may have. Thank the teachers for the work they do and thank the children for being such great listeners and learners. A strong beginning and ending add an extra touch of professionalism to your program.

To Charge or not to Charge

I saved the tough question for last. You want to provide a service yet there are things to consider, like the three T's: time, travel expenses, and talent. I realize all of us volunteer to do programs but charging for your expertise is appropriate.

Many people are uncomfortable charging a fee for their services. If that is your experience here is little trick you may want to try When someone calls, go over everything you offer and end by saying, "My normal fee is such and such. (Fees may vary depending on size of the crowd, what kind of program you will be doing, and the kind of group who is making the request.) Be willing to negotiate. I have even accepted plants and seeds as compensation for a presentation.

If they are in need of a volunteer you can offer to do it yourself or you can pass names of other people you know are interested in providing that kind of volunteer service. If you have groups come to your honey house or apiary for field trips, charging a fee for each student is a reasonable request.

What If Talking to Groups of "Young People" is Not Your Idea of Fun?

Maybe formal presentations are not for you. Here are some other ways you can contribute to educating the next generation about honey bees.

1. offer field trips to your apiary or honey house

2. set up and maintain an observation hive at a school

3. create hand outs to give to teachers

4. create a bibliography of books for children about honey bees that are available at your local library

5. educate educators offer workshops for teachers about honey bees

6. encourage members in your local beekeeping organization that show an interest in making presentations

7 create learning packets about beekeeping for teachers to check out. For example it could include a bee veil, smoker, hive tool, super and frames, honey to taste and bees wax.

In Conclusion

Learning is fun! If you keep that in the forefront of your mind you will be able to give children something they will carry with them into adulthood – the appreciation of their tiny flying friends. Sharing your expertise about honey bees with children and caregivers is a valuable and worthwhile endeavor The hugs and "thank you notes" are just the icing on the cake. BC

Kim Lehman has been a bee steward for 15 years. As a university-trained teacher with over 25 years experience working with children, Kim works as a children's performer and educator. You can ontact Kim at kim lehman@sbcglobal.net, 512.627.0113 or P.O. Box 2743, Austin, TX 78768.

Another Job For Busy Bees . . .

Honey bees are the perfect choice for vectoring biocontrol agents

Leah Smith & Zachary Huang

Honey bees are best known as the most important pollinator, then as the producer of honey, beeswax, and several other hive products. However, there is a new role that the honey bees are playing, this is to as a vector for dispersing biological control agents.

Answering The Call

Interest in biological control of plant pests, which may be fungal, bacterial, or in the form of an insect, has greatly increased in the past few years. To date, honey bees have been tested as possible vectors for biocontrol agents of several different pests and diseases. But why research new forms of pest control in crops? Are producers dissatisfied with the current methods of pest control? And why use honey bees as vectors?

Chemical Control: Always Reliable?

Traditionally, chemical pesticides have been the favored control for several plant pests. However, pest after pest is developing resistance to the chemical treatments used against them. For instance, streptomycin is no longer an effective control of fire blight, a bacterial disease that affects crops such as apples and pears. Chemicals used in pest control can often be harmful to other organisms in the agricultural ecosystem besides the target pest, some times beneficial parasites or pollinators. Additionally, concern for air and ground water quality is increasing and leading to the removal of many chemicals from the market. What this means is that new methods must be investigated for pest control.

Biological Control: Critters, Not Chemicals.

Biological control, which is the use of a natural, living enemy to control a plant pest, seems a promising alternative to the use of chemicals. It is often host specific, or at the least specific to a narrow range of hosts, which means it poses less of a threat to non-target organisms. Microbial plant pathogens are often controlled by other microbes that act against the pathogen. They may prevent a plant pathogen from infecting a plant by preemptive colonization and exclusion, which means they target the nutrient-rich surfaces of the plant that the pathogen would normally colonize and colonize it first, leaving no space or resources available for the pathogen. Additionally, they may produce antibiotics to the pathogen at the same time, further blocking its colonization. Biological control, or biocontrol, of insect pests acts in a different way, often by directly attacking and killing the pest, preventing it from damaging the plant in question.

It sounds as if biocontrol should work very well for plant disease or pest control. The trick is getting them to the plant where they can do their job. At first, biocontrol agents were simply being sprayed indiscriminately onto the entire plant. However, in many cases, the pest's activity on the plant can be narrowed down to a limited area, such as the flower or in some cases even as specifically as the stigmas of the flower. In such cases, spraying an entire plant with a biocontrol agent when only the flowers need to be sprayed represents a rather large waste of the biocontrol mixture, time spent on application, and money spent on the entire procedure. Additionally, the timing of biocontrol applications is crucial, as it was with chemical sprays. The flowers of plants do not all open simultaneously. In order to apply a control to the most flowers as possible, farmers had to either apply

at peak bloom (and simply let any blossoms that opened later remain vulnerable), or have more than one spraying. Additional sprays would mean additional time and money spent. The million-dollar question then becomes how to inoculate only the flowers of a plant with a biocontrol (without it being very labor intensive), and would there be a way for this inoculation to proceed over an extended period of time without very high costs?

It sounds as if using honey bees for biocontrol should work very well for plant disease or pest control.

Honey Bees As Vectors?

Honey bees are well known vectors of not only pollen, but of bacteria, viruses, and fungi. Several studies have shown that honey bees are capable of transferring organisms that cause plant disease from plant to plant. So why not use them to transfer organisms that we want in our crops? Honey bees possess the ability to pick up and transfer a biocontrol on their bodies and to deposit it specifically onto a plant's flowers, often directly onto the stigmatal surfaces. What is more, honey bees would be able to inoculate blossoms throughout the growing season, often soon after flowers open, without additional costs to the farmer. This is due to the honey bees' foraging patterns. Additionally, biocontrol agents may spread to untreated flowers without the aid of the honey bee vector due to the movement of the biocontrol itself. Once a biocontrol agent has successfully colonized a flower, it could disperse to other flowers on the same plant by other mechanisms, such as raindrop splash.

Perfect For The Job.

Honey bees seem a natural choice for vectoring biocontrol agents to crops because of their role in crop pollination. Throughout the year, honey bees visit millions of flowers in search of nectar and pollen. The body of the honey bee is highly specialized for the collection of both. One such specialization used for the collection of pollen is the presence of setae (or branched hairs) all over the body of the honey bee. These are tiny hairs that pick up pollen particles as the bee climbs over flowers in search of rewards. They are crucial in the collection of pollen, because they represent such a large surface area to come in contact with pollen. Beekeepers have used this behavior to their advantage already, by placing pollen inserts on hives for honey bees to crawl through on their way out of a hive to pick up pollen for dispersal. These inserts are used to provide honey bees with this pollen in case insufficient pollen or lack of pollen of a compatible cultivar (which may be the case in an apple orchard) may threaten thorough pollination of a crop. The transition to biocontrol vector is now clear. By placing either powdered biocontrol compounds or pollen covered with biocontrol agents in similar pollen inserts, the honey bees exiting the hive will transport these agents to flowers, performing yet another beneficial task.

There are several other key points that make honey bees suitable as biocontrol vectors. As with any efficient organization, honey bees want to maximize the benefit from the efforts of each individual for the entire colony and want to lessen duplicated efforts. When a honey bee finds a good nectar source, she will communicate its location to the rest of the colony and then many will be exploiting this food source until it is exhausted. This behavior is a perfect design for using honey bees as biocontrol vectors. Honey bees will remain faithful to one crop until pollination is no longer required. Thus, when that crop is in bloom and honey bees start to visit it, they will not stop until the bloom is over. If the biocontrol agent is placed in the beehive just as the target crop comes into bloom, the honey bees will deliver the biocontrol agent to that crop and only to that crop until the bloom is over

How To Go About It.

For successful control of a plant pest, honey bees need to be properly inoculated with a biocontrol agent every time they leave the hive to go foraging. They need to pick up a sufficient amount of inoculum so that they will have enough to deposit on several flowers during that flight. Thus far, a few preparations have been used to make biocontrol agents available in a form that honey bees would be able to pick up and transport. These preparations include placing biocontrol agents on supplemental pollen, into mixtures such as talc-corn meal, or simply making dried bacterial preparations available to the honey bees. A second necessary element for inoculation is that the biocontrol agent be made available to the workers every time they exit the hive. The exit with the biocontrol agent preparation should be the only way available for the bees to leave the hive, and it is normally helpful if there is some cue to encourage them to exit that way (such as light at the end of the tray to guide them out, while light is obscured from all other directions). Additionally, there must be a separate entrance for the honey bees returning to the hive. The tray containing the biocontrol inoculum must be made long enough so that the distance through which the bees crawl will allow them to pick up sufficient inoculum. Most trays used so far have had lengths around 12 cm.

Examples

The following are examples of plant pests and the biocontrol agents that have been vectored by honey bees in an attempt to control them. Of the four examples, two involve plant pathogens, where preemptive colonization is key to proper control, and the other two deal with the control of plant insect pests with biocontrols.

Fire Blight. Fire blight, which chiefly appears in the commercial production of apple and pear crops, is caused by the bacterial plant pathogen *Erwinia amylovora*. This disease not only will destroy the harvestable crop for a single year, but if the case is severe enough it may kill the entire fruit tree. Death of the entire tree occurs when the pathogen spreads from the flower, site of initial infection, to the twig and subsequently to the branch and trunk of the tree.

Continued on Next Page

BUSY BEES ... Cont. From Pg. 47

Clearly, the blossom blight phase of this disease cycle is the most readily targeted for control of the pathogen, at which time it colonizes the stigmatic surfaces of the flower The biocontrol agents used for control of this pest have been *Pseudomonas fluorescens* and *Erwinia herbicola*, both of which are bacteria. They control the pathogen by preemptive colonization of the flower stigma, though *Erwinia herbicola* also produces inhibitory compounds that further help to prevent the establishment of the fire blight disease. Though this is the biological control/honey bee vector model that has received the most attention so far, more research is still required before farmers can successfully initiate this system for fire blight control.

Grey Mold. Grey mold is a pest of several crop plants, ranging from flowers such as begonias, peonies, and geraniums to fruits and vegetables such as apples, pears, peaches, raspberries, blueberries, grapes, tomatoes, and beans. It is also a pest in strawberries, the crop in which use of a biocontrol has been attempted. Grey mold is caused by the fungus *Botrytis cinerea*, which will first invade the targeted plant's flower and then proceed on to the fruit. The fungus *Gliocladium roseum* was the biocontrol agent used for attempted control of this pathogenic fungus. Results were encouraging, but more research is required before this biocontrol/ vector system can be successfully used.

Banded Sunflower Moth. The banded sunflower moth, *Cochylis hospes* is an important pest of sunflower crops. It is present in many of the temperate areas of North America, but causes its most significant economic damage to crops in North Dakota. The crop is damaged when larval stages of the insect feed on disk flowers and seeds. Control of this pest was attempted with the bacteria *Bacillus thuringiensis*. The bacteria was vectored by honey bees to several flowers within the composite sunflower head, where larval death followed. Outcomes were very favorable, but more work is required to ensure sufficient control with the system.

Corn Earworm and Tobacco Budworm. Both corn earworm *Helicoverpa zea* and tobacco budworm *Heliothis virescens* are pests of several crops. The corn earworm is a pest in crops such as sweet and field corn, tomatoes, soybeans, tobacco, and cotton, to name a few. In these crops, damage is done by the larvae, which will feed on blossoms, buds, and fruits. Corn is its most common and economically impacted crop. Here it begins damage by feeding on the silks and interfering with pollination, and then by proceeding to the ear where it consumes kernels and leaves excrement. The tobacco budworm, like the corn earworm, will attack tobacco, cotton, and soybeans, as well as flax and alfalfa; additionally, it has the potential to attack several vegetable and flower crops. Crop damage is often seen on the buds and fruit of these crops. Biocontrol of these pests was attempted simultaneously on crimson clover, another crop that both pests attack and which is also readily foraged by the honey bee. Control was attempted with the *Heliothis nuclear polyhedronsis* virus (HNPV). The study found that control with HNPV that is vectored by honey bees is a definite possibility, however more research is required first before this occurs.

Winning Combinations.

In all of the aforementioned attempts at biocontrol, the controls used and vectored by honey bees provided as good or better control of the crop pest than the biocontrols applied as sprays and/or chemical control methods.

- In the case of fire blight, the success of the biocontrol was noteworthy because many orchards are developing pathogens resistant to streptomycin, the most popular chemical control. A somewhat limited control of frost injury and russeting on pears also occurred as secondary benefits.
- In the control of grey mold, the ability of the fungal biocontrol to affect the pest was helped by the fact that the conidia, or fruiting structures, of *Gliocladium roseum* has a rather sticky surface, enhancing its ability to stick to both the honey bees and subsequently the flowers of the strawberry plants.
- In the case of the banded sunflower moth, control was improved by the fact that honey bees are primary pollinators of sunflowers and readily visited the plants. Additionally, the plants treated with the biocontrol experienced increased seed set and the production of seeds with slightly higher oil content. However, *Bacillus thuringiensis* is susceptible to inactivation by sunlight and this must be taken into account when future use is considered.
- In the case of control of insect pests in crimson clover, results were quite favorable. Again this is in part due to the fact that clover is readily foraged by honey bees.

The success of all of these studies highlighted some noteworthy, though expected, ideas. Control of the pests was better in every case when the weather conditions at the time of the monitoring favored foraging by the honey bees (warm, sunny weather as opposed to cool, cloudy weather when honey bees are normally not active). Secondly, success of the biocontrol is increased when vigorous honey bee colonies are used to deliver the inoculum.

Future Plans.

The future of honey bees as successful biocontrol vectors is somewhat contingent on the successful use of biocontrols in the future. Biocontrols, in general, have a history of inconsistent performance, due to the fact that it is often hard to control colonization of the plants by the biocontrols and to maintain uniformity. One way to try to ensure more uniform performance by a biocontrol product is use a mix of biocontrol agents that thrive under different climatic conditions, produce different antibiotics, or use different control mechanisms to increase the likelihood that you will have an effective biocontrol out in the field that season. Additionally, the use of different biocontrol agents will lessen the likelihood of the target pests developing resistance to the control. It is also clear that the various biocontrol agents used in a treatment must not interfere with the growth of each other in order to control the pests effectively.

There are some additional challenges specifically facing the future of biocontrol vectoring with honey bees. The application of biocontrols with honey bees must be critically timed to be effective. Furthermore, weather conditions must be conducive to honey bee foraging for the biocontrol to be dispersed. This means clear skies, little wind, and relatively high temperatures for good control. However, remember that all of these requirements for proper dispersal are not as restrictive as they seem because the same conditions are needed for the implementation of most pest control programs, especially chemical controls. Some general challenges are that certain concentrations of biocontrols are required to successfully inoculate plants against their pests. Merely increasing the concentration of the biocontrols in the exit tray of the hive means there must be some way for the organisms to survive until they are dispersed by the honey bees. Placing the organisms on pollen grains, which will provide them with temporary sustenance, is one way to achieve this. Another issue is that when vigorous honey bee colonies are used for dispesal, the inoculum in the exit tray may be quickly depleted and in need of refilling often. In one study, 10 grams of inoculum was used up in 15 minutes. At the other end of the spectrum, inoculum not used quickly enough may absorb moisture and develop clumps or a crust providing the bees with a path through the exit tray on which they will not pick up inoculum. The bees will take this path if they can, because they do not like being covered with the inoculum, and thus they will leave the hive without picking it up. Another limitation to keep in mind is that honey bees will preferentially forage crops that they like, such as peach and cherry. Unfortunately, pears and strawberries are crops that they will not visit if preferred crops are blooming. However, the use of chemical attractants may be used to help overcome this limitation.

There is great potential for the use of biocontrols to control both plant pathogens and insect pests of plants through the use of honey bee vectors. Many plant pathogens colonize the flower of the plant it affects, right where honey bees will visit the flower and carry out their activities. Control of a great number of plant insect pests is also possible, for honey bees forage on several plants that are subject to damage from insect pests. However, for successful control, a better understanding of the relationships among the flower, pest, and biocontrol(s) concerned in each particular situation is required. With a little more research and time, however, honey bees will soon be ready to fly onto the scene of plant pathology with an entire arsenal of microbes to send those pesky pests packing! BC

Reference:

Gross, Harry R., John J. Hamm, and James E. Carpenter 1994. *Design and Application of a Hive-Mounted Device That Uses Honey Bees (*Hymenoptera: Apidae*) To Disseminate Heliothis Nuclear Polyhedrosis Virus.* Environmental Entomology. 23 (2): 492-501.

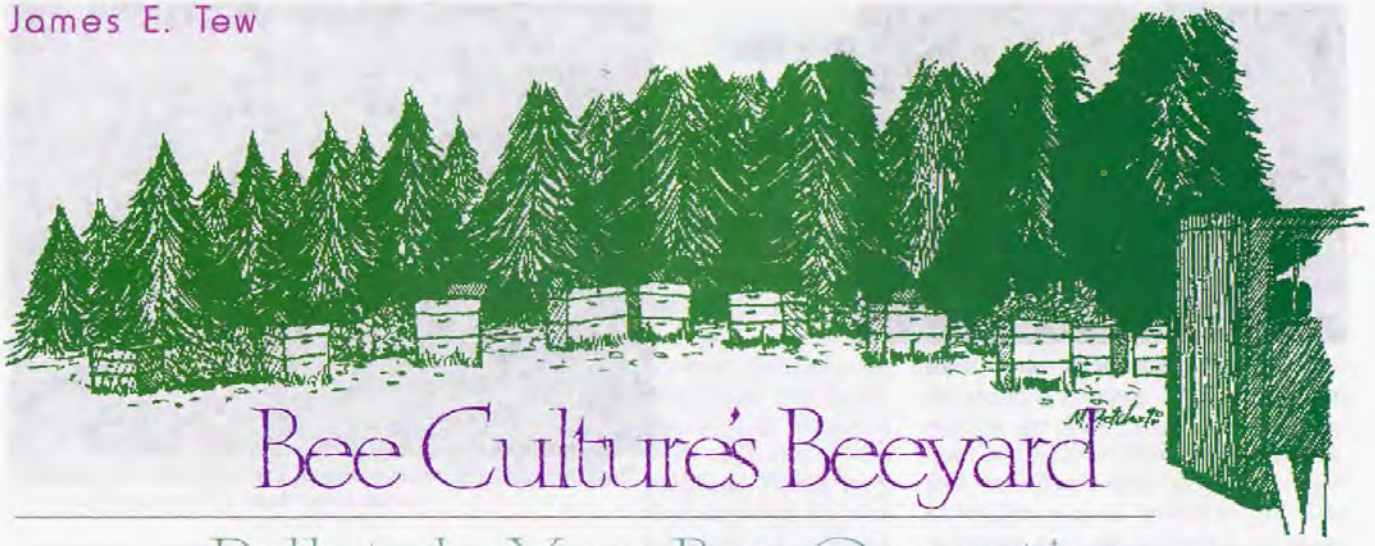
Johnson, K.B., V.O. Stockwell, D.M. Burgett, D. Sugar, and J.E. Loper 1993. *Dispersal of Erwinia amylovora and Pseudomonas fluorescens by Honey Bees from Hives to Apple and Pear Blossoms.* Phytopathology. 83: 478-484.

Peng, G., J.C. Sutton, and P.G. Kevan. 1992. *Effectiveness of Honey Bees for Applying the Biocontrol Agent Gliocladium roseum to Strawberry Flowers to Suppress Botrytis cinerea.* Canadian Journal of Plant Pathology. 14 (2): 117-188.

Thomson, S.V., D.R. Hansen, K.M. Flint, and J.D. Vandenberg. 1992. *Dissemination of Bacteria Antagonistic to Erwinia amylovora by Honey Bees.* Plant Disease. 76: 1052-1056.

Zachary Huang, Assistant Professor, 517.353.8136, Department of Entomology, Michiga State University, East Lansing, MI 48824, http://bees.msu.edu; email: bees@msu.edu.

James E. Tew



Bee Culture's Beeyard

Pallets In Your Bee Operation

Pallets, pallets everywhere

I forget the exact number, but I recently read that there are something like a dozen forklift pallets for every woman, man, and child in this country Millions and millions of these devices are in existence. In my area of Ohio there are companies that specialize in pallet construction and there are even companies that repair and rebuild pallets. There are journals on pallet construction and annual meetings of pallet-building companies. It's big business.

Years ago, in a moment of cheap weakness, I took on the project of disassembling pallets for the oak lumber from which they were constructed. What a pain that was. Glue-coated, spiral-shank nails were used to assemble the pallet making it nearly impossible to take apart. I got that project out of my system remarkably quickly.

Standard pallets

Though there must be a "standard pallet," size, I don't know what it is. Pallets seem to have a general size, but the actual construction design varies – I suppose depending on the specifications of the customer who is buying and using the pallet. Everything, including beehives and beehive equipment, seems to have been on a pallet at one time or another Though wooden pallets are more common, recycled plastic is frequently used to produce molded pallets. What does this mean to us? There are pallets everywhere. I generally have no problems scrounging free ones.

General pallet use

Even if you never use pallets as bottom boards for hives, pallets are useful in some cases in storing equipment. Cement floors are frequently damp or unleveled. Though wood pallets will obviously rot when used outside, they still provide several years of use before serious decay sets in. By that time, you could have begged some more. In my lab we use wooden pallets in the storage barn as well as some of the beeyards. In the beeyard we use pallets as platforms on which to sit four beehives. If you are using standard pallets as foundations for hives, you'll note that the appearance is not great. We only use them in remote yards – not the yards I frequently photograph or to which I take visitors.

A standard unmodified pallet.

Specialized beehive pallets

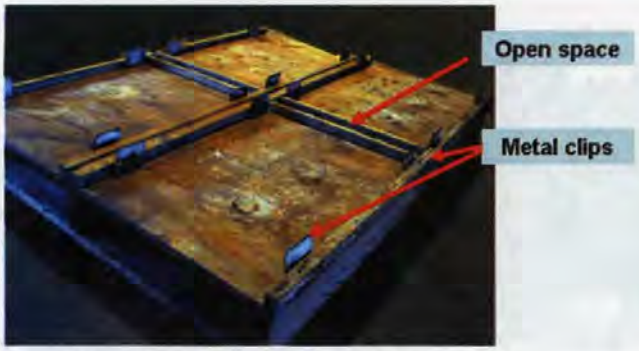
Specially designed pallets evolved as commercial beekeepers began to use "skid-steer" and other types of mechanical loaders. Though they exist, I have never seen a beehive pallet that did not accommodate anything but four beehives. Two hive entrances face each end of the pallet and some kind of clip arrangement is necessary to keep the hives from slipping off the pallet when being moved. More on this later.

Many beekeepers design and build their own pallets. An Ohio commercial beekeeper developed the design that I am describing below. His entire beehive population, about 2000 hives, sat upon these pallets. One could expect to get about twelve to thirteen rows of pallets on a semi-trailer and – depending on weight – be stacked two to three deep.

One design of a commercial beehive pallet

The design of this particular pallet is straight-forward. Ideally, pressure-treated lumber should be used. The bottom supports are three stan-

Continued on Next Page



A beehive pallet with support clips.

The bottom of the pallet showing four brace boards and the center drain hole.

dard treated 2x4s. The ½" plywood used to form the pallet deck is also moisture resistant.

Pallet measurements

The overall measurement of the beehive pallet is 33 3/8" wide x 44¼" long. The center strip is 2-3/8" wide x ¾" deep x 44¼" long. The side strips are ¾" x ¾" x 44¼" The four back strips are ¾" x ¾" and are 14-7/8" long. The rails underneath are milled and treated 2x4's that are 44¼" long. There are four boards that brace the bottom of the pallet. These treated boards are milled 1"x4" and are 33-3/8" long.

The plywood deck is ½" thick. Two plywood pieces are needed that measure 33-3/8" wide x 21-½" long. An open back space (see photo) will remain at the center of the pallet to allow rainwater to escape. Otherwise, a solid piece of plywood measuring 33-3/8" x 44¼" could be used.

The pallet pieces are assembled with galvanized 2" screws. The ¾" strips are attached with galvanized nails. A small notch is cut underneath the side and center strips to accommodate the thickness of the pallet clip. When assembled, the pallet weighs 37½ pounds and requires no painting.

Pallet clips

Pallet clips can be improvised in the shop or purchased from bee supply companies. Pallet clips are positioned in the four corners of the bottom deep. Rather than clips, some beekeepers partially drive large nails into the corner spots to hold the equipment in place. But nearly anything is possible. In years past, I used flat metal stock that I nailed to the sides of the pallet to serve as stops. Still other beekeepers have made the pallet slightly wider and improvised wooden strips to hold the equipment on the pallet. Obviously, there is no "standard" beehive pallet.

As a general rule, nothing should go on the sides of the pallets or hives that would snag as the bundle was being loaded or unloaded. It seems to me that this usually happens at night when you can't see all that is happening.

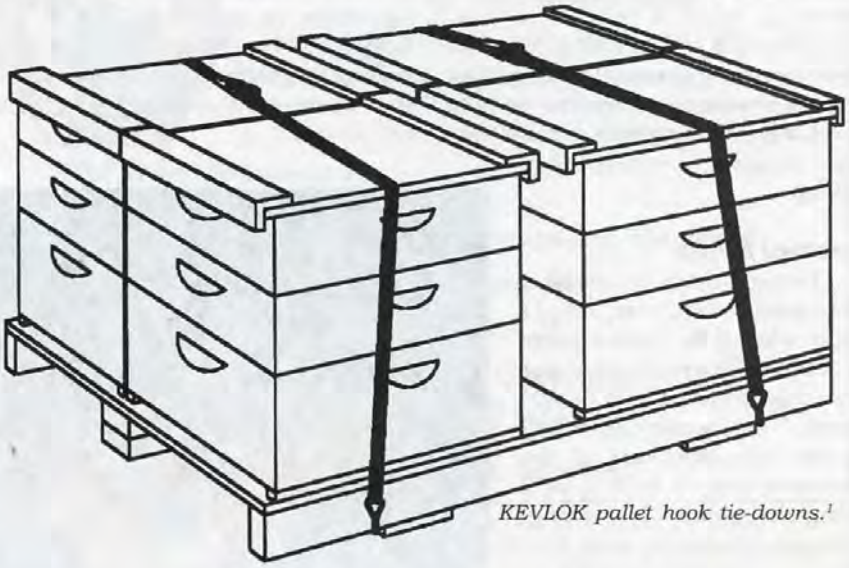
Palletized hive equipment

If more than a single deep per hive is to be used on the pallet, the upper deeps or supers must be stapled or otherwise attached to the bottom brood chamber Remember that the bottom brood box is held in place by metal clips, wooden cleats, or nails. To reduce overall weight and to allow more space on the truck, migratory tops are used without inner covers. The outer covers must be attached to the top of the hive. Tops can be nailed or metal banding or nylon straps can be used while the hives are in transit. The load of hives should be covered with a nylon net.

Pallet problems

While these are desirable devices for migratory beekeepers and stationary beekeepers alike, they are not without some problems.

1. The clips make it difficult to stack when storing and other-



KEVLOK pallet hook tie-downs.[1]

[1]Beekeeper & Pallets, Miami, Florida.

A single-piece molded plastic pallet.[1]

wise carrying the pallet around. The clips seem to snag on everything.

2. There is not a convenient handle for carrying the pallet.
3. The pallet is reasonably heavy.
4. Animals and insects live underneath the pallets – especially fire ants. In warm climates, cockroaches are notorious for living between warm, moist beehives. In many parts of the U.S., woodchucks, skunks, and mice are frequent intruders around palletized beehives. (But these pests could very well be around hives not on pallets, too.)
5. In hot climates, metal strapping bands may expand and allow equipment to shift a bit. Neither plastic nor metal banding should be left at the pollination site. It gets caught in the landowner's mower

Molded plastic pallets

Recently plastic molding companies have manufactured a line of plastic pallets. Since restraining ridges are incorporated into the plastic design, no clips are required. The unit is rot-proof and requires no painting. Prices vary and depend on the number of pallets purchased.

The ReSky Company (http://www.resyk.net/clients.html) in Utah writes on their web page that it, *"uses contaminated/commingled plastics as its raw materials."* to manufacture beehive pallets and its other inventory listings made from recycled plastics.

Another company, AGM Container Controls[2] produces a tie-down strap called the *KEVLOK Reusable Pallet Tie-Down Strap.* The specialized strap has a hook that catches the 2x4 rails and ratchets the nylon strap on the top of the hives. The pallet design in the diagram is somewhat different from the one I described above.

For most of us

Most hobby beekeepers won't need specialized pallets, but may profit from traditional pallets used simply as foundations for hives. But it would not be impossible for the stationary beekeeper to build a few of these units for hives not intended for routine moving. Essentially, you would be building four bottom boards and four hive stands at once. But, without a fork-lift loader, such colonies would need to be dissembled and repositioned on standard bottom boards when the occasional move is required.

Additionally

While I did a reasonably good search in preparation for this article, I cannot say that it is inclusive. No doubt there are companies manufacturing pallets and ancillary equipment that I did not mention. Any omission was not intentional.

And thanks go to Steve at Cherry Hill Honey in Michigan for giving me the idea of exploring pallet design and use. BC

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684, Tew.1@osu.edu, www2.oardc.ohio-state.edu/agnic/bee/; www2.oardc.ohio-state.edu/beelab/

[2] AGM Container Controls http://www.agmcontainer.com/tiedowns/palletHNS%20Presentation/HNSPALL_HTML.htm

NUMBERS

The conventional wisdom is that all beekeepers are getting older and fewer and fewer younger beekeepers are starting out. Well, that's not true of our readers.

Right now, 11% of our readers are under 40, 44% between 40 and 55, and 45% over 55. 25 years ago 5% were under 40, and 61% were over 55.

And, the number of females has doubled in only 10 years. In 1994, only 5% of our readers were women, now, it's up to 12%. That's a significant jump. More importantly 90% of these readers are under 40. Beekeeping's growth appears to be gender specific.

WILD BLUEBERRY LAWSUIT SETTLED

Kathy Birt

"It's Business As Usual"

With a negotiated settlement of $5 million, it's looking like the Maine blueberry growers and processors will be "back in business" come Spring.

This turn of events will, no doubt, change the approach to the pollinating business as well as the processing and growing end of the state's biggest industry.

But it wasn't that long ago that Jasper Wyman and Sons, CEO Ed Flanagan was adamant that the blueberry processing company had no plans to bring in bees for pollination for Maine growers for the Spring of 2004.

However, he now says, "Its business as usual."

He says the Jasper Wyman plant, has been very busy with sales during the crises and did not shut down. To his knowledge, he notes that Oxford (another processor) did a partial shutdown.

The two-year class action lawsuit, initiated by the Maine blueberry growers against the processors for what has been termed "price fixing," came to fruition in a Knox County courthouse last November

The jury verdict awarded blueberry growers $18.68 million, in the lawsuit, but being an antitrust case, the figure was automatically tripled to $56.04 million.

In essence, the verdict stood to put Maine blueberry processors out of business.

But, said David Bell, Executive Director of the Maine Blueberry Commission, the lawsuit, which he termed ludicrous, was a Catch 22 situation.

"If the processors go out of business, where do the growers sell their blueberries?"

With upwards of 800 growers in the state, Bell says it was only a handful that launched, and settled, this precedent-setting lawsuit. Those growers named in the law suit include Nathan Peese Jr., of Union, Alan Johnson, of Rockport, Carl Cuningham of Waldoboro, and Thomas Worcester of Columbia.

The verdict essentially shut down Cherryfield Foods (a processor), and left processors Jasper Wyman and Sons, and Allan's Blueberry Freezer debating their future.

The Knox County Superior Court jury concluded that between 1996 and 1999 these three companies conspired to fix prices.

Bell points out that the Commission is gravely concerned about the impact (of the lawsuit) to the growers and processors.

"The goal is to make sure the processors and growers continue to do business, but with a law suit hanging over their heads, banks won't extend credit as working capital." He says if there is no working capital, it's the small growers who get hurt.

He says processors have millions of dollars invested in their processing plants, and "They have more to lose (than the growers)."

One primary player in all this is a blueberry entrepreneur of sorts who doesn't own any equipment. "He is a land owner who contracted everything out," states Bell.

With firsthand knowledge, Bell, says this landowner made 15 to 16 cents per pound during a specific time period, while the processors made only four to five cents. "From a capital perspective, it's backwards.

He admits that the blueberry growers may have a better understanding of the industry (than the processors.) "One grower will hear of another getting a few cents more, and look for the same price. Is that price fixing? Or is it market

Continued on Next Page

BLUEBERRY ... Cont. From Pg. 55

demand?"

Bell points out that the industry has had it's own way of operation for generations. And, it may not be the same from one grower to the next. "A handful of co-ops have contract and/or business arrangements and others do business with a handshake, and have been doing that for generations."

In essence, the executive director infers that one grower may set a field price, while another does the same, but, not necessarily the same price. "It's on the spot field situations."

And, these on the spot handshakes may no longer be working in this new century Flanagan points out that Wymans have always provided far more than a handshake. The company provided working capital for their blueberry producers to the extent where no cash of their own was used to get the crop to market.

"In the past we have always borne the cost for all our growers. We buy the chemicals, and we order the bees and bring in thousands and thousands of hives from across the States and distribute them (to pollinate the crop)."

At a cost of $50 U.S. per hive, any one grower having a hundred acres, would have to come up with at least $10,000, to successfully pollinate the crop, points out Flanagan.

He says Wyman's have a family of lenders and, in turn, they are the lenders for the growers. "We provide advances and, basically, the growers bring in a crop without putting out any money With this lawsuit hanging over us, and had it not been settled, we would not be in a position to do this for the coming season. Now with the $5 million settlement, Flanagan notes, "Our banks are pleased with this and we will go ahead with the season as long as the banks are comfortable."

Remarking on the four growers who initiated the class action lawsuit, Flanagan says 75 percent of growers in Maine opted out. "The court appoints lawyers for them, and these lawyers appoint themselves "the class." Most members of the growing community have no idea they are in the lawsuit."

Being a lender to the growers has always worked in the past, but, for now, Flanagan's ire is up. He says there is a huge risk for the industry to keep moving forward while three of the largest processors were in the middle of an appeal of the verdict. "It is a blatant extortion racket, and that's how America differs from Canada. We have all these frivolous lawsuits going on."

Speaking of last November's verdict, the CEO says he believes the judge hand-delivered the verdict to the jury, with his remarks, adding, "What is evidence and what isn't."

And, as for sharing this mutual verdict with Cherryfield Foods, Flanagan says, "This is preposterous. We have been hostile, vigorous competitors for a very long time. The only thing we've ever agreed on is the lawsuit."

The extortion comment keeps coming back for Flanagan, as he points out that now Wyman's have settled, as has Oxford. "The state mediator realized this was blatant extortion, and showed understanding of the situation," said Flanagan.

He notes that Wymans have agreed to pay out a million and a half, with five annual payments of $300,000. One of the partners of Oxford agreed to $2.5 million settlement, payable in cash up front. And, he points out that the mediator put down on the table $1 million for Allan's, payable in five payments of $200,000, but Flanagan indicates Allan's did not agree.

But, he notes, "I'm pleased with the settlement."

He says taking into consideration the amount of fruit involved in this lawsuit, Wyman's felt the whole issue was a very unfair distraction (from the industry). Flanagan says looking at the industry, two-thirds of the fruit Wyman's processes, "We grow." And, he states that in the remaining one-third, 75 percent of growers opted out of the lawsuit. In that remaining amount, which is 25 percent of one-third, 50 percent of those growers signed a petition to opt out. "So, basically, only four percent of the fruit Wyman's grows was in the lawsuit, and that percentage was holding Wyman's hostage."

Flanagan says in defending this lawsuit, over a period of about two years plus, the amount of money lost exceeds two-and-a-half million. "Forget about the money we have to pay out. This sets a very dangerous precedent and we wonder how a little factor (like 4 per cent) can create such a problem."

He says when John Bragg, who owns Oxford Frozen Foods in Nova Scotia, (Canada), bought Cherryfield Foods in the 1980's, the obvious thing would have been to combine. "But, we have never made friends, even though out plants sit next to each other."

Although he says the Jasper Wyman plant on Prince Edward Island (Canada) is a separate entity from the Maine business, and that their Canadian assets are in a much better position to do business, he says the lawsuit, "Troubled our bankers and upset the growing community."

The CEO for Oxford Frozen Foods, David Hoffman, declined to comment on the lawsuit.

But, with more than Maine blueberry growers involved, Prince Edward Island blueberry grower John MacDonald of Souris expresses concern over the lawsuit and was following it closely.

MacDonald harvested 600,000 pounds of blueberries on PEI last year and half a million on contracted land in Maine. "With Cherryfield Foods the biggest grower of (this) fruit in the world, if they go under, it could hurt a lot of people."

Although MacDonald is an Oxford account, he says he is concerned for Jasper Wyman, too. "We need viable operators. We need healthy competition, too. But there is too much fighting going on."

With blueberry contracts in Maine, MacDonald inevitably has business dealings with Cherryfield Foods, a sister company to Oxford Frozen Foods, and says they tell him not to be concerned. "They tell me that I should be ready to come to Maine in the spring. But, how do we organize for the season? How do the companies organize?"

Now, with the settlement in the offing, MacDonald says he is still playing it cautious. "We haven't given our names to immigration yet."

He says he feels Allen's got a raw deal in the settlement, but adds this conflicting remark. "If they (the processors) were guilty, this settlement wouldn't be fair to the growers. And, it looks like they are admitting guilt, if they (processors) want to settle."

Up until now, MacDonald says, settlement or no settlement, the judge still has to approve it. Reiterating on Flanagan's remarks re pollination, MacDonald says that is usually taken care of before he arrives in Maine, because the border between PEI and the U.S., is closed. But, MacDonald says, "We're trying to get it open. I would like to be able to bring migratory beekeepers from Florida all the way up to PEI." He says now that bees are able to move inter-provincially, it's time they were moved internationally.

To try and make some logical sense of all this, David Bell concludes that he believes in any business there is a risk. "There are good years and bad years, and it would seem the growers on the winning end of the lawsuit are trying to be compensated for the bad years."

But, he adds, "The whole irony of this is that the growers say this case is not about money. They want a different business model."

At the time of the verdict last November, Bell says his thoughts were that if this lawsuit is truly not about money, then the growers should have dropped the financial verdict, because, he notes, emphatically, "That's what's going to ruin the industry." BC

Kathy Birt, Freelance Journalist & Photographer, Box 7104, Cornwall, PE C0A 1H0, 902.566.3023, Fax: 902.566.3023, E-mail: kathybfree@pei.sympatico.ca

Management For Nectar Collection

Walt Wright

In this segment, some of the internal colony operations (objectives and activities) that influence nectar/honey accumulation will be described. In the period up to the "main flow" appearance of new wax, internal operations have more influence than the availability of nectar in the field. The over wintered colony is preoccupied with reproduction in the early season and only forage for nectar needed to support that objective. Field nectar abundance is not reflected in the amounts brought into the hive prior to new wax at the start of the "main flow."

The literature treats top or bottom supering as a matter of beekeeper preference. Literature references note the extra effort involved in bottom supering, but do not make a recommendation for either When you understand the colony internal operations and storage traits, you can apply those characteristics in your judgment.

Substantial description was provided early in this series of the honey bee's origins. The colony's adaptation to life in the hollow tree really is relevant to your manipulations. Nobody moves comb or adjusts available space in a fixed volume residence. Bees' survival instincts are disrupted or disturbed by beekeeper activities. A couple of traits will be identified first that reflect some difficulty on the part of the colony to adjust to those unnatural changes.

Once the colony has started working in a super, the work will continue in that super when moved up or down in the stack above the brood nest. It doesn't matter whether the "work" is retrieving honey for feed or storing new nectar, the work force stays with the relocated super There must be a lower limit where this is not true, but if a fourth of the comb surface is covered with bees, they continue the work after relocation. Raising the super above two or three empty supers does not discourage the work in progress.

Second, the colony will generally not use added space immediately It takes some time for the colony consensus to adjust their "space-available" perception. Inspection of the added space may start promptly under some circumstances, but even that is not guaranteed. There are exceptions though. In all cases, some worse than others, there is a delay between adding space and the colony's readiness to use it.

Neither of the above characteristics is likely to cause significant impact on honey production. Both are included here to encourage you to become familiar with the bee's development schedule for your area. When you know what operational changes to expect, and when to expect them, you can anticipate the needs, and adjust space so you don't reduce colony performance.

The next trait to be described *does* affect honey production. The colony has the ability to *anticipate* a result that affects the balance of population and stores. It's routine in the hollow tree but becomes significant in a managed beehive. Basically the colony has the ability to make adjustments in operations before the need becomes critical.

Some experts still recommend that you should super as needed. "As needed" is generally described as the last super nearly filled, or half to two thirds capped. The bees anticipate meeting survival requirements of filling their cavity, and start brood nest reduction well before filling their last super. The lesson here is to over-super to keep the colony striving to fill the space available. The bees, whose objective is to fill the available space, foresee that filling is close and start brood nest reduction. One other consideration that is related is that 4,000 bees can't find workspace in a partial honey super. The combination of anticipation of meeting survival requirements and a surplus of workers without space leads to accelerated brood nest reduction. Brood nest reduction automatically reduces the work force to exploit the trailing edge of nectar availability. A robust population at the beginning of the main flow can fill three or more shallow supers with workers at the same time. Why would you want to limit the space for them to do their thing efficiently?

When the work force is compressed by supering "as needed," another undesirable effect is created. The colony will often fill the bee space between top bars of a lower super and the bottom bars of the next higher super with cells of honey. The accumulation of honey in the interbar space makes separation of supers more difficult at harvest time. Fractured cells of honey are mostly wasted and create a riot of robbers at harvest. The streamers of trailing honey between the hive and the truck leave a path to the truck. More problems! We

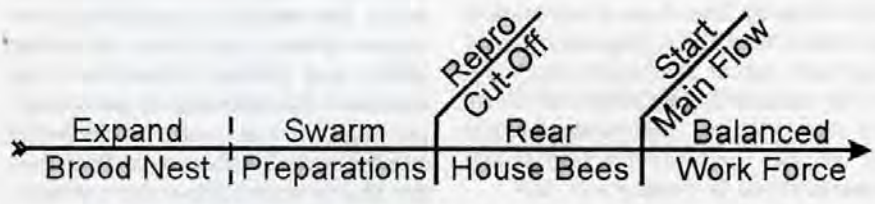


Figure 1. *Four main divisions in colony operations.*

Continued on Next Page

NECTAR ... Cont. From Pg. 59

might add that the waste of interbar honey can count up. The 3/8-inch of interbar space is more than 8% of the 4¼ inches of comb surface of a shallow super. Most colonies put very little comb in the interbar space when over supered. Harvest is simplified.

Enough of the general characteristics! The intent of this article is to identify effects of the Spring season operational changes on nectar accumulation. Figure 1 breaks the Spring season into four major operational periods. Since the earlier segments of this series described the operations for these periods, this treatment can be limited to a discussion of how those operations affect nectar accumulation.

Segment 1 of Figure 1 is the early brood nest expansion in late Winter. The emphasis during this period is on consumption of honey for brood nest size expansion. If water is available very little foraging for nectar is required. Foraging for pollen and water has priority. Pollen is required for brood feed and water to thin honey to feed consistency. If water is not readily available, the colony can use nectar to thin honey.

The exception to the above generalization is that the colony places higher priority on empty cells within the cluster than on pollen for brood rearing. If there are empty cells, from V-mite attrition for example, the colony will forage for nectar on a priority basis. When the empty cells within the cluster are filled with nectar, they can change back to normal foraging patterns. An early season check of landing board traffic can alert you to empty cells in the cluster. If a high percentage of bees are returning with no pollen or split loads, that colony needs feeding. Split loads are indicated by less than a full load of pollen, where the forager is gathering both nectar and pollen from the same source. It is difficult to focus on the hustling, returning forager to see that the abdomen is partially distended with nectar.

As noted earlier in the discussion on swarm preparations, the start of swarm preps is dependent on the colony reaching the maximum safe brood nest expansion. The timing of that operational change is affected by many variables. In addition to the natural variables, you could be scrambling the configuration of their residence pursuant to swarm reduction. Not willing to treat all the "ifs, ands, or buts" of possible manipulations, the following is limited to the colony that does not reach the safety limit, and does not start swarm preps.

When overhead capped honey is continuous, and the colony is expanding the brood nest, the colony is not likely to store nectar above the capped honey. Nectar foraging will be reduced. They seem to perceive the top of the capped honey as the top of their residence. Supers added above the reserve capped honey are often ignored up to repro cutoff. At repro c/o the colony starts consumption of the reserve, which opens the path to overhead nectar storage. The weaker colony, then, will generally not store nectar overhead until the "main flow."

The colony that is strong enough to start the swarm prep brood nest reduction (second segment of Figure 1) also will typically not store nectar above the reserve. They will normally honor the reserve, and any nectar stored will be used for feed and decreasing the brood nest size. Progress in brood nest reduction leads to the starting of swarm cells. As long as the capped honey reserve is continuous across the top of the brood nest, the colony can, and often will, ignore empty comb above. But when the upper level of brood reaches *to* the empty comb, their perception of the empty comb immediately above is improved. Nectar storage moves into the empty comb above. Overhead nectar storage tends to offset brood nest reduction and inhibit swarm preps. Although done for the wrong reasons, the swarm prevention techniques of hive body reversal, taking splits, and colony division have the common denominator of potentially putting brood in contact with empty comb above. To the extent that they do, those techniques are successful in swarm prevention.

Detouring into swarm prevention was accidental, but it is important to understand that the colony is reluctant to store nectar above their reserve of capped honey. If you intend to take advantage of the "early flow," you must open up or remove the reserve barrier to overhead storage of nectar. That's what nectar management is all about.

Assuming you have taken steps to encourage overhead storage of nectar during the buildup, the accumulation of nectar is limited by another characteristic. The colony will only store nectar within the cluster limits. The Spring cluster is about 50% larger than the brood volume when adequate comb is provided. Figure 2 is extracted from the presentation given to local bee clubs. It shows the relationship of brood volume to nectar storage in the late buildup for my area. The sketch presents the volumes for a modest over wintered cluster that has been encouraged to grow at their best rate by nectar management. The nectar storage gain is dependant on several factors.

A. Since the comb surface that they will fill is limited to the cluster volume, deeper cells will accumulate more.
B. Some curing of the nectar is taking place even in cooler weather by virtue of evaporation in the cluster. The colony will maintain the cells at the filled level by continually topping off with additional nectar.
C. Without wax-making capability in the late buildup the nectar cells will generally remain open until the appearance of white wax at the beginning of the main flow. We have seen some colonies try to cap cured honey at the top of the brood nest with old wax with poor results.

It would seem that bottom supering during the buildup would produce more nectar accumulation. I have not tried it for two reasons. I have confidence in the efficiency aspects of their system, First, if I raise a super of nectar above their controlled environment, it might sour. Second, if I put additional strain on their forager force, the penalty might come in the "main flow." You can try bottom supering prior to white wax if you like, but it will be difficult to assess the full

season merits.

You may have noticed that we put "early flow" and "main flow" in quotes. There is a good reason for this. Both are misnomers. There is only one Spring flow. The "early flow" is the upswing and the "main flow" is the down swing. In between is the peak of native woodland forage and the bees add no nectar at that time. The hive scale, if used to show nectar in the field, lies with a capital "L." The recorded weight changes are seen through the operational changes of the colony being weighed.

If you doubt the validity of the above observations, take a walk in the woods during the three-week lull in nectar gain. When hardwood leaf-out is in progress, note the trees in bloom. You might not recognize the streamers of oaks and nut trees as flowers, but you couldn't miss black locust. And how would you know that oaks were not a nectar source if it always blooms in the storage lull? One season, I recorded several other trees in bloom where binoculars were needed to see the tiny blooms. A local example: hackberry.

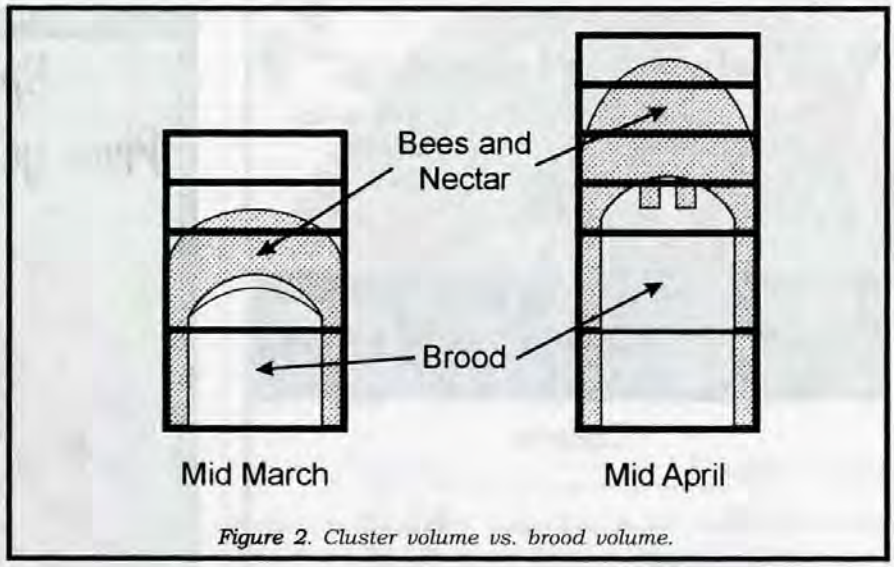


Figure 2. *Cluster volume vs. brood volume.*

The lack of storage of overhead nectar during the period after reproductive cutoff, and prior to the white wax flow, is open to discussion. If my hypothesis is correct, it's the period that the colony is rearing house bees to support restocking Winter stores. Another observation, coming from experimentation with nectar management, is also puzzling. During the lull in overhead nectar storage, the cluster, or concentrated bees, *does not grow*. Although the colony is generating a full brood cycle of new bees, the volume of concentrated bees remains the same. If the colony will only store nectar within the cluster perimeter during buildup (and that is true) failure to increase the cluster size would account for failure to add nectar at the top. Note that if you have swarming plus or minus a week of white wax appearance, consider them overcrowding swarms, and review your management program.

One last note on the overhead nectar gain during the three-week period prior to the "main flow." If you have practiced supering "as needed" during that period, the lull might not have been conspicuous. The natural cluster comfortable height has been compressed all the way. When a super is added, after some delay, the cluster expands into the added super Enfolded in the cluster, that super is now filled. When the next super is added, the sequence starts over. It would be possible to add supers through the storage lull and have the colony continue to fill them. This doesn't happen if two empty supers are maintained through the buildup. There is a definite three-week period when no supers are required to maintain two empties. Note that cluster size, as shown in April of Figure 2, is static (unchanged) for that three-week period, but the brood volume is decreasing from the top.

But why doesn't the cluster grow? Our best guess is that the wax makers being generated for the white wax flow congregate in the upper levels to raise the temperature to the 100°F level required for wax production. If you have a better answer, send me a postcard. Again, to gain nectar storage through this period, you might try bottom supering with the risks noted above.

The last period of Figure 1 is the white wax flow. As we see it, there is no advantage to bottom supering for extracted honey during the white wax flow. Another colony characteristic is that they will readily open gaps in the solid cluster during the white wax flow through supers that are completed by capping the honey. With warmer ambient temperatures, the clustering is no longer required. As long as ample space is maintained at the top of the colony, honey accumulation is only limited by bee power and field nectar availability. And sensing the nectar trail off, they will manage to get the brood nest reduced in a timely manner Or that's what happens in Tennessee.

We top super all the way, by maintaining two empty supers of drawn comb. The often expressed concern about wax worm damage to extra empty supers at the top, is unfounded. The wax moth does not become active in my area until early in the white wax flow. Honey bees get the jump on hibernating insects by Wintering as a colony. They will be patrolling the whole hive well before the wax moth is active in the Spring. That may not be true for milder climates.

This concludes the descriptions of survival traits on which nectar management is based. It is low-effort beekeeping that has the side effect of increasing honey production. Are those features not of interest to you? BC

Walt Wright is a sideline beekeeper at his home in Elkton, Tennessee.

American Holly

Move now to take advantage of this *First Rate* honey plant.

Keith Copi

Bees shoot out of the hive entrance like anti-aircraft fire. Incoming foragers land hard on the bottom board, almost with a thud. In the air there is a heavy, overly sweet smell, almost like over ripe peaches. It is a perfect day in early May, and the holly flow is at its peak. American holly (*Ilex opaca*) has got to be one of the most under rated honey plants in North America.

The plant

American holly is the largest of North America's native hollies. At its best – such in open woods, at wood edges, or in a landscape use – it is a gorgeous pyramid of a tree capable of reaching 50 feet in height. More commonly it is a smaller, sparser tree growing in the under story, especially in lowland (moist) woodlots. It is common throughout much of the southeast, especially in the coastal plain and piedmont, and along the gulf coast. Its range follows the east coast up into Massachusetts, and American holly is reported to be locally abundant in parts of West Virginia and Pennsylvania. The landscape trade recognizes over one hundred cultivars (named varieties) of American holly, so suburban beekeepers may enjoy the benefits of this plant well outside of its native range. The leaves are of the classic holly shape, sharply spined, and evergreen. The flowers are tiny (1/4 inch in diameter), white with yellow centers, and very fragrant. They are produced in great abundance in mid-spring. Male and female flowers are borne on separate plants. Female flowers pollinated by male flowers will develop into red berries which persist on the plant through Winter, providing valuable food for birds. Many of the first robins of Spring arrive in the North fueled by holly berries from the southern woods.

The flow

Like with many woody plants, the nectar flow is short and very intense. Individual hollies bloom for only about one week. Many beekeepers consider holly to be a 10 day flow. In my experience, in areas with a lot of American holly, it is more like two weeks. In my area (central Virginia) the holly flow begins the last week in April or the first week in May. To put that into perspective, it blooms after, but overlapping a bit with black locust, and before, but overlapping a bit with tulip poplar. If the weather during the holly bloom is warm and somewhat humid, the nectar flow is intense. In both quantity and quality of nectar secreted, American holly is a world-class honey plant. My bees generally will not store tulip poplar until most of the holly bloom is gone. More than one local beekeeper has arrived at a swarm call only to find that the "swarm" is thousands of foraging honey bees frantically working a blooming holly. Under the right conditions, a medium super (or more) can be stored in a week.

Ah, but conditions are seldom perfect. The problems with a flow like this are obvious. The time of year is prone to bad weather which can greatly reduce the flow of nectar, and the bee's ability to gather it. The

Continued on Next Page

flow is early enough that only colonies which have over-wintered well, and then do not swarm, can store surplus honey on it. If American holly bloomed in June I would have honey supers stacked half way to the moon! As it is, I realistically expect one medium super from this source, for each over-wintered, non-swarming colony.

The honey

Honey made from American holly is light and mild, with a fruity undertone. I have also heard the flavor described as "having a twang," which I will not argue with. In the very least, I would say the taste is a bit unusual, unique, and memorable. I would readily put it up against any of the great honeys of the world. It is 10 carat gold in color It is very fragrant, with the heavy, sweet smell of the flowers from which it came. Open a jar at the breakfast table, and everyone seated there will smell it. During extraction, holly honey is easily distinguished from other light honeys by this smell. Some people consider both the scent and taste to be a bit "over the top."

Even in areas where American holly is abundant "holly honey," as a local varietal, is not commonly offered for sale. Most beekeepers probably simply find it to be easier to let it blend with the other Spring sources. Beekeepers that do take the time to isolate holly honey as a distinct varietal should find a ready following for this top-notch honey. Holly honey is also well known for being slow to granulate, and should have a shelf life of at least one year.

American holly is a first rate honey plant. Beekeepers who locate hives near sources of this plant will not be disappointed. Beekeepers who take the time and effort to produce holly honey will find ready markets and raving fans. American holly belongs with clover, black locust, tupelo, gallberry, and sourwood on the list of reliable sources of high quality light honey. BC

Keith Copi collects holly honey around his home in Richmond, Virginia.

Spring Cleaning

Clean, Neat & Efficient

Ann Harman

In days long gone a great event took place, one that was designed to chase family out of the comfy home or else be put to work. That event was known as Spring Cleaning. The whole house was turned topsy-turvy; rugs were hauled outside to be beaten, obviously putting Winter demons to rout. Everything was scrubbed, even if the paint disappeared. And to top it off you were given a Spring Tonic so that all your innards sparkled like the house. Today we take a kinder approach to Spring.

However, April is a good time to revive that old custom but instead of comfy home, take your energies to your honey house, equipment storage and beeyard. Your bees are working hard in most parts of this country but unless you take a little time now, you will be stumbling over unused equipment and looking at broken queen excluders in a very short time.

April is a good time to sit down and make a plan for the coming bee season. With such a plan you will know when you are busy, too busy and not busy. If you are a gardener you can work the gardening cycle into your beekeeping plan. Yes, a rainy day will cause you to swap some days for others but at least you can keep up with everything that needs to be done. Besides you can work Summer holidays into the schedule so that you can have a great picnic on July 4th instead of pulling honey supers off. You might even find time for a well-deserved vacation (actually all vacations are well-deserved).

Your plan is really a calendar of events. For example you will note down approximately when honey supers will go on and off, mite treatments, a period for extracting and bottling, taking care of customers, Fall inspections, feeding, care of equipment, purchases, and any other tasks you normally do for your bees.

In spite of all our new mite-resistant queens and IPM approaches, beekeepers will still have to test and possibly treat for mites at some point. Enter that into your season's plan so that you do not forget. Having a plan for pest control means that you can actually fit that into you busy days and not keep putting it off.

You may have reviewed your equipment needs during the Autumn and Winter and discovered what you will need for this beekeeping season. If so, you are ahead of schedule and can take advantage of used equipment for sale because it may be cheaper now. If you are totally fed up with your old extractor you can shove it aside and plan to sell it when other beekeepers suddenly find they need one – at extracting time. Meanwhile you can search around your area for a used one, perhaps from someone moving or graduating to a larger one.

Used wooden ware is always a bit of a problem because of disease. But here you may well find some worthwhile bargains if you are careful. With uncapping equipment, jar-filling equipment and such you can upgrade your operation with lesser expense than buying new. Put a "Wanted" ad in your local beekeeping newsletter and read through the ads in the beekeeping journals. You may find you can afford a nice piece of equipment that you thought was beyond your pocketbook.

Although this may be in the category of counting your chickens (honey harvest) before they hatch (the flowers bloom) see if you can find bargains in containers. Glassware and plastic ware keep so if you have a nonexistent flow this year, those containers will wait until your luck improves. If you cannot find such bargains, make a note to keep trying. Yes, you may have to wait until next Winter, but at that time stock up and save some money doing that. Having an inventory of your containers, lids and labels is an important part of beekeeping. Label manufacturers are used to the hysterical rush at bottling time but you still have to wait your turn. With an inventory taken now you can sit back and enjoy your 4th of July picnic.

If your label is antiquated and boring now is the time to redesign it or shop for a new one. You will have enough time to have it printed – even with your own computer – before filling containers. Take advantage of April showers that keep you inside and see if you can design some new labels or work with someone knowledgeable in commercial design.

While you are taking container inventory start considering bottling your honey in some new containers. Perhaps all you use are glass jars. Maybe it is time you packed some honey in bears, a very popular packaging. If you are thinking about some upscale shop as an outlet for your honey you need to look through the catalogs, especially that of Mid-Con. Customers respond to attractive containers with modern, well-designed labels. If you are featuring two or more varietal honeys, a handsome container calls attention to your special flavors and your honey can be priced accordingly.

Stop grumbling about cost of containers. Although you make the initial payment, every time you sell honey in a specialty jar it is the customer who is paying for that jar. Do not be afraid to raise your price to cover a specialty jar

It would be good to put into your season's plan a time to visit some possible new markets for your honey.

Continued on Next Page

SPRING CLEANING ... Cont. From Pg. 65

You are keeping track of newly-opened shops aren't you? Look for gift shops that may be featuring a local craftsperson. Linking up honey with those who create gift baskets can create a very lucrative market involving little effort. Roadside stands that disappeared with road construction last year need to be replaced with new venues. Perhaps it is a good time to visit with some local farmers who sell excess fruits and vegetables from their farm. Although the best time to search out new roadside vegetable stands is during harvest season there is no reason why you can't explore those venues during a quiet time on your calendar of events.

Or have you decided that this year you are going to sell in 60s only? There seems to be a trend towards healthy foods in schools. Although a public school system may not be receptive to your honey, many small private schools exist.

However, to really interest a school or other institution into using honey, you will need to provide recipes and information on honey and using honey in large-scale cooking. The National Honey Board has such recipes and information so take advantage of what is available at nhb.org. Small bakeries can also benefit from honey if provided with recipes and the availability of help from the National Honey Board.

This Spring is an excellent time to give your honey house – whether a corner of the garage or a full-scale honey house – a thorough cleaning. You just might discover a long-lost smoker or hive tool. Anyway, the Small Hive Beetle (SHB) really loves messy, sticky honey houses. The South African beekeepers, who live with the SHB, keep very clean honey houses and use other management practices so that the pesky beetle is not a problem.

If you are finding it difficult to keep your honey house clean perhaps now is the time to consider what can be done to make it easier. A bit of money spent now may be saved in the long run if you have successfully made it difficult for beetle life. The beetles are tiny, quick and reproduce at an incredible rate, putting mice and rabbits to shame.

As you are cleaning up, scrubbing and rearranging everything (at least carpets do not need to be beaten) keep ease of honey harvest in mind. Think back on last year and the year before. Did uncapping, extracting and bottling proceed smoothly or did some part or equipment placement seem awkward? You are probably stuck with the space you already have. Now make plans for efficient use of that space.

Equipment storage in your honey house needs attention. You will need to accommodate any newly purchased equipment, including glassware. Many items can be stored on shelves to leave the floor more easily cleaned. Go ahead and make the shelves now. If you know a contractor who does kitchen remodeling you can frequently buy the old kitchen cabinets cheap or even free. Just make sure they are in good condition and not full of mysterious gunk.

Have you considered a secondhand dishwasher for your glassware? Yes, it requires a source of water but if available water makes honey house cleanup easier and better, then some plumbing work will be a good investment.

If moving equipment around, especially stacks of honey supers or hive bodies, is inefficient, why not make some dollies so all you have to do is push and guide instead of lifting piece by piece. All sizes of wheels can be bought at your local hardware store. A set of four and some 2X4s can be quickly turned into dollies that fit your supers. You can fashion a bottom as a drip pan for full honey supers or have it serve as a bottom for treating the stack for wax moth, plus as a mouse barrier for Winter storage. Once you start using dollies you will wonder what took you so long to discover them. Dollies serve for all sizes of operations. Even someone with two hives is going to have a collection of supers for them. Being able to reposition a stack of supers with just an easy push makes honey house maintenance easier. Boxes of empty glassware as well as boxes of bottled honey can live on dollies. Why carry boxes full of bottled honey out to your truck when you can just push them out.

Keep your calendar of events handy for review, and revision if necessary. You should find this season's bee time more efficient and pleasant. Your honey house is clean and free from SHB, your heavy supers are moved around with a push and you have found a wonderful new shop for your honey sales. Your bees will appreciate all this, I am sure. BC

Ann Harman is cleaning her honey house, and carpets, in Flint Hill, VA.

INNER ... Cont. From Pg. 8

creasing registration fees even more they raised the cost to all those beekeeping businesses that show up, they offered paid-for ads in the program and introduced a lower cost lunch.

Doubled registration fees. Higher costs for vendors. Paid-for ads. Scaled down lunches. An attendance disaster in the making? Not even close. There were fewer people attending this year. Down 10% or so from the record breaking attendance of last year. Some, I'm sure due to the increased cost, but the vagaries of this year's program, the weather and the stuff of life adds in too. This meeting still, with pride, can claim to be the biggest one-day beekeeping meeting in the U.S. No contest.

Why? It's simple, really. You got your money's worth, pure and simple. For $30 you got a plenary talk by Jim Tew (go ahead, put a price on that!), plus your choice of four of 16 workshops. That's five hours of beekeeping mainlined right where you need it, plus the vast array of vendors, plus 600+ people to touch base with. That comes to less than $4/hour cost. There is a value to this meeting.

And that, exactly, is where this is going. What else can you get for $4/hour? Let's see. A not very fancy restaurant meal will cost you about $10, for an hour. A movie is $8 for two hours. You are worth more than that to your boss, I'll bet. What does he get from you for $4?

The point I'm making here is that we need to look carefully at what we charge for meetings, what we are offering, and what we are willing to pay to go to meetings.

When lots of things were free, it was easy to give them away. Free meeting rooms, volunteer speakers, free AV equipment to use, volunteers to set up, register, take care of problems and put it all away at the end of the day. Basic amenities like heat, lights, a person to open (and lock) the doors were generally included with this free set up. Even parking has taken a turn for income generation in some places.

Add to this the sophistication of the meetings themselves. Jim Tew set up, with lots of good help, a live satellite connection with his brother in Tennessee to real-time visit-and-watch in-hive demonstrations. Almost everyone today has a laptop computer and uses a digital projector. There's the real basics like name tags – not your ordinary write-your-name-on kind, but those with the plastic pocket and the elastic string. And the folder, paper, pencil, program and the postage to mail out the registrations and the computers to gather and organize all this.

Well, guess what. Almost none of this is free anymore. Speakers don't have travel covered, rooms aren't free, projectors aren't free, name tags aren't free, coffee and rolls aren't free. Not anymore anyway.

And of course there are extreme opinions. I talked to people at this meeting that had very different views. The first, the most cynical of the two sides, said it was about time we began charging what a meeting was worth (not, mind you what it cost) because we (the beekeeping community) made it too easy to get started. We charged virtually nothing for our services, said my cynical friend. But more importantly, he said that we don't put a value on what we do.

The other extreme I heard that day, and have heard countless times before was that we should be honored to pass along what we know for free. It was given to us for free, and we should share what we know for the same price.

When your group sponsors an event, how do you handle it? There are fixed costs, certainly. And they are rising and not going away. Donuts and coffee, rooms, AV equipment, building staff, parking, room rent – all of these have a cost. Do you pass these costs along, eat them as a group, does the facility (college, nature center, etc.) eat them, or more likely, hope you have enough people attend, paying an arbitrary registration fee, to cover your costs. Is breakeven your goal?

The Ohio State University isn't giving away anything for free anymore. They can't afford to. The question is, then, can we?

Is breakeven the norm? Do you absorb the costs in the spirit of educating new members? Do we make it too easy to start keeping bees? Or is there a value-above-cost attitude in your group?

As a beginner, what's your take on this? Are you willing to pay for the classes and expertise when you start out? Or is free, or almost free expected? Where's the line drawn that the learning part would be too expensive (yes, the equipment is expensive) to even consider starting?

The whole world of beekeeping is changing to accommodate much of the rest of the world. Everywhere groups are examining these questions, and beginners are weighing choices. Does beekeeping education, either as a beginner or as ongoing classes have a perceived value? Is it like the quart jar of honey for $8 or $9 (that's 3 pounds), or the 6 ounce fancy jar for the same price? What should it be? What could it be?

Two people I work with here recently signed up for a one day class to learn how to better use a graphics software program we have. They already know the basics, but this was a bit more than basic. This class cost $150 each. They didn't have to pay it of course, the Company did, which does make a difference. But there certainly is a perceived value to that class.

If you have a thought on this, lots and lots of people would like to know. As an industry, a business, a hobby we're in transition, and most of us are still trying to figure out the best way to proceed. Input is useful. Let me know here, and I'll share your ideas with all the rest. And yes, I'll do it for free...if you send them in for free.

See, now I'm getting cynical.

Already some of you are catching swarms and managing for the honey flow. Some of us are still wading in mud and feeding colonies. April is the cruelest month, but April come She will. This month is a lot like being a teenager. Hormones are raging but undisciplined with little opportunity to figure out what it all means or do anything about it. Hurry up and wait.

While you're waiting, make sure your beesuit is clean and patched, your hive tool is sharp and your smoker stays lit. You can see, if you look close, another chance to get it right, right on the horizon. Go for it this year And have a good time getting there.

?DO YOU KNOW?

Getting Started

Clarence Collison
Mississippi State University

Spring is often referred to as a time of "new beginnings" and many individuals will get into beekeeping for the first time. As equipment is purchased and assembled, many decisions have to be made in regards to what kind of equipment to buy, how to put it together and where to get your bees. As you study the various beekeeping equipment catalogs and trade magazines, it becomes evident that the industry has a variety of different pieces of equipment for various functions, which could become overwhelming for the inexperienced individual. For the experienced beekeeper, these decisions seem elementary and are given little thought until they have the opportunity to help a new beekeeper or are asked to participate in a beginners bee school.

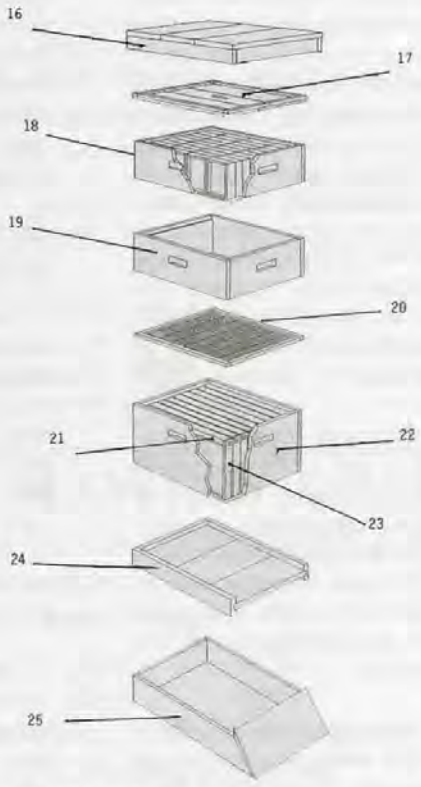
Please take a few minutes and answer the following questions concerned with "getting started in beekeeping."

The first 13 questions are true or false. Place a T in front of the statement if entirely true and F if any part of the statement is incorrect. (Each question is worth 1 point).

1. ___ Sheets of foundation with embedded vertical wires and hooks along one side are used with wedged top bars.
2. ___ Standard-sized Langstroth hive bodies are designed to hold nine frames.
3. ___ Sheets of plastic foundation within wooden frames are held in place with embedded horizontal wires.
4. ___ Package bees are normally sold in three and four pound sizes.
5. ___ Hive stands are a required piece of equipment.
6. ___ Thin-surplus wax foundation is used in honey supers that are used to produce liquid extracted honey.
7. ___ The inside and outside of the hive are normally painted.
8. ___ Oil-based paints are preferred over latex paints for painting bee hives.
9. ___ Inner covers are normally used on all hives.
10. ___ Hives made out of cypress wood normally last longer than those made out of pine.
11. ___ Pollen substitutes contain zero-percent pollen.
12. ___ Dried pollen has greater nutritional value than frozen pollen from the same floral source.
13. ___ Pollen from maple trees is more important in colony buildup in the Spring than pine pollen.
14. If a beginning beekeeper wants to know how long they should feed sugar syrup to a newly installed package of bees, what would you tell them? (1 point)
15. Under what conditions is it best to draw wax foundation? (1 point)

Please match the following terms with the appropriate piece of beekeeping equipment in the diagram that follows. (10 points)

A. Queen Excluder B. Section-Comb Honey Super
C. Bottom Bar D. Hive Stand E. Telescoping Cover
F Brood Chamber G. Slatted Rack H. Top Bar
I. Honey Super J. Bottom Board K. End Bar
L. Inner Cover



Answers On Next Page

?Do You Know? Answers

1. **True** One approach of strengthening wax foundation is to purchase it with embedded vertical wires and hooks on one side. This type of foundation is used with a wedged top bar. First the wedge is removed from the top bar with a sharp knife. Then the hooks are placed up and against the shoulder in the top bar. The wedge is then placed in position in front of the hooks and nailed straight down into the top bar.

2. **False** The Langstroth hive used today in American beekeeping is known as the "standard hive" and is designed to hold 10 frames. As the comb foundation is drawn out, some beekeepers may use either eight or nine combs, rather than 10.

3. **False** Plastic sheets of foundation are held within the frame by using either grooved or wedged top bars and grooved bottom bars. Horizontal wires are not embedded into the plastic, as they are with foundation made out of beeswax to prevent foundation sagging. Some types of foundation containing a thin sheet of plastic are held in place with support pins. These support pins are small metal pins similar to clothespins. These pins are pressed through the holes in the frame end bars so that the foundation is held in the pin slot.

4. **False** Package bees are usually sold in two- or three- pound sizes. Each package consists of the appropriate weight of bees, along with a caged laying queen and a pint can of sugar syrup. Four and five pound packages can also be purchased but are not common.

5. **False** Commercial hive stands are not a required piece of equipment. In principle, they support the floor of the hive up off the ground which reduces dampness in the hive, extends the life of the bottom board and helps keep the front entrance free of grass and weeds. Many beekeepers support their hives on pallets, concrete blocks, railroad ties etc.

6. **False** Thin surplus foundation is not used in honey supers to produce liquid extracted honey. Thin surplus foundation is used in the production of section comb honey, cut-comb honey and chunk honey.

7. **False** Normally only the exterior of the hive is painted. The bees will varnish the inside of the hive with propolis. The inside of the hive is not painted to allow the wood to absorb moisture produced by a colony.

8. **False** Painting the outside parts of the hive is recommended. A good grade of primer plus two additional coats of white paint is recommended on new wood prior to its use. Some prefer a good grade of aluminum paint instead. To be functional for many years, wooden equipment will require frequent protective coating. Latex paint is the most common protective coating. Penetrating oils, advertised for beehive use, are commercially available and offer a high degree of woodenware protection.

9. **False** Inner covers are normally used on hives with outer telescoping covers but not on hives with migratory lids. Advantages of using an inner cover include: 1) less disturbance when removing the outer cover thus reducing colony defensiveness; 2) creates a dead air space for insulation from heat and cold; and 3) the center hole may be fitted with a bee escape to aid in removing bees from honey supers.

10. **False** Ponderosa pine is generally accepted as the preferred species of lumber for hive and hive part construction. Spruce and Idaho white pine may be used, but are less desirable for interior parts. Original growth cypress is an excellent lumber to use but is now scarce. While second growth cypress is fairly common, it is generally considered no more durable than the pine parts that are easier to obtain and easier to machine and use.

11. **True** Pollen substitutes are a mixture of water, sugar and other materials such as soybean flour, powdered skim milk, or brewer's yeast, or a mixture of these used in place of pollen to stimulate brood rearing.

12. **False** Freshly trapped pollen is perishable and must be either frozen or dried. Several researchers have shown that the nutritional value of pollen decreases upon storage. The nutritional value of dried pollen decreases faster than when it is stored frozen.

13. **True** Pollens differ greatly in both nutritive value and attractiveness to bees. Pollen from maple trees is very important in early colony development in the spring. While honey bees also collect several wind-borne pollens, such as pine pollen, they typically are of lower nutritional value to the colony.

14. They should continue feeding a newly installed package of bees until the bees stop taking the syrup. The new colony will reduce its syrup intake or refuse syrup altogether when nectar becomes readily available to them.

15. Foundation will not be drawn out by bees unless there is a good source of nectar coming in. Sugar syrup should be supplied to newly installed packages or swarms.

16. E) Telescoping Cover

17. L) Inner Cover

18. B) Section-Comb Honey Super

19. I) Honey Super

20. A) Queen Excluder

21. H) Top Bar

22. F) Brood Chamber

23. K) End Bar

24. J) Bottom Board

25. D) Hive Stand

There were a possible 25 points in the test this month. Check the table below to determine how well you did. If you scored less than 12 points, do not be discouraged. Keep reading and studying- you will do better in the future.

Number Of Points Correct
25-18 Excellent
17-15 Good
14-12 Fair

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

BOTTOM ... Cont. From Pg. 80

cans.

The dinner was at the class president's house on a hilltop with a breathtaking view of rolling hills covered with grape vines planted in neat rows. I, however, cut sort my scenic enjoyment to lie on a couch inside the house in a state of serious sweats. Still, the medical attention was great. My Air Force friend called in another classmate, a dermatologist. He reassured me by pointing out that I'd have been dead on arrival at the dinner if I were allergic to bee stings. After a high-level consultation, however, my medical friends decided that I'd live, but that the swelling would increase for another 36 hours. Good grief, I thought. I'm flying from San Francisco to Newark in the morning without my wife, who was returning later Will I be able to hobble onto the plane with or even without luggage?

I did make the trip back in much better shape than I feared. Within a week, all was normal. But boy, did I learn a lesson. There are times when swallowing your pride and backing away are much better than showing off your stuff in the face of considerable danger

Honey Slogan Contest Winners

Well, the votes are in and counted. And the winner is – Ta da –

1. Honey – Sunshine In A Bottle
   Submitted first by Anne Frey
   (winner of a five-year subscription)

2. Bee Healthy – Eat Honey*
   submitted by Richard B. Smith
   (winner of a one-year subscription)

3. Honey for Health
   submitted first by Sally Ellis
   (winner of a one-year subscription)

*There was a tie for second place, the other was, however, submitted by one of our staff so it wasn't considered as a prize winner – The slogan was
Honey – Pure Flower Power

Use any of these if you want on your label, signs, promotions, whatever . . . And thanks to everyone who sent in ideas, and everyone who voted.

HONEY ... Cont. From Pg. 11

They had 71% of U.S. colonies in 2003, and over the last five years averaged 69% of all colonies in the U.S.

Here's a number that doesn't just pop out at you. Total colonies have increased, since the low point in 2001, by 84,000. Meanwhile, the top 1 increased by 103,000. Growth and migration continue to add to the top 10, while slow decline and emigration are norm for the rest of us.

Reasonable expectations would predict these two trends to continue for both production and colony counts. But here's a sobering thought. California and North Dakota, combined, produce 34% of U.S. honey A prolonged, or even acute drought or other extreme weather event in either of those places would make a big hole in U.S. honey production. If both? Ouch.

We figured per capita consumption again this year, just to see where it's going. Here's how we do that, and where the numbers come from.

Per Capita Consumption

Plusses	**Mil. Lbs.**
Production	181.1
Stocks In	39.4
Loans	5.9
Imports	205.1
Total	**431.4**

Minuses	**Mil. Lbs.**
Stocks Left	40.7
Exports	2.3
Import Stocks left (Est. at 15% of imports)	30.8
Total	**73.8**

To Calculate Per Capita Consumption

Consumption	**Mil. Lbs.**
Production	431.4
Removed	73.8
= Consumed	357.6
÷ Population	290.8
Per Capita	**1.23 lbs/person**

(That's 19.7 ounces)
in 2001 it was 1.18 lbs/person or 18.9 ounces.

The population then was 284.8 million people. This may seem trivial, but let's look further. The per capita difference between 2003 and2001 is only .8 ounces – not much. However, there are 6 million more people. .08 oz. x 6 million people = 300,000 pounds of honey – the amount produced in Virginia and Maryland, Combined last year That comes to, if you're curious, 455 barrels of honey.

Finally, there are caveats with this data. The USDA people don't count producers with fewer than five colonies. Thus, they don't count production, either. This is unfortunate but understandable. Further, the double count thing (colonies that produce honey in more than one state are counted in each state) does muck up the numbers, too.

However, they are consistent from year to year in these errors, which makes the data trends pretty reliable.

Top Ten

	1999		2000		2001		2002		2003	
	x1000 Col	x1000 Prod lbs	x1000 Col	x1000 Prod lbs	x1000 Col	x1000 Prod lbs	x1000 Col	x1000 Prod lbs	x1000 Col	x1000 Prod lbs
CA	505	30.3	440	30.8	425	27.6	470	23.5	480	32.1
ND	255	26.8	300	34.5	280	26.9	320	24.0	340	29.6
FL	228	23.3	232	24.4	220	22.0	220	20.4	210	14.9
SD	224	23.3	235	28.4	235	15.3	225	11.5	200	14.0
MN	145	11.9	150	13.5	135	10.9	117	8.5	120	10.0
MT	122	8.5	124	10.9	136	13.9	134	8.4	145	9.6
TX	108	8.7	105	8.3	97	7.7	114	7.6	140	9.4
WI	80	6.0	84	7.6	67	5.4	70	6.7	74	5.7
NY	69	4.8	58	4.6	53	3.7	60	5.8	67	4.8
MI	73	6.2	72	5.4	76	4.6	72	5.5	65	4.8
Total	**1809**	**149.8**	**1800**	**168.4**	**1724**	**138.9**	**1802**	**121.9**	**1841**	**134.7**
All States	**2688**	**205.2**	**2620**	**220.3**	**2506**	**185.5**	**2574**	**171.7**	**2590**	**181.1**
% of Total	**67%**	**73%**	**69%**	**76%**	**69%**	**75%**	**70%**	**71%**	**71%**	**74%**

Honey Prices 1993-2003

Cents/lb.	93	94	95	96	97	98	99	2000	2001	2002	2003
All Honey	53.9	52.8	68.5	87.8	75.7	65.5	60.1	59.7	70.4	132.7	140.4
Retail	81.3	89.1	100.0	117.3	125.7	114.7	126.6	130.4	142.2	152.5	184.9
%Difference	151%	169%	146%	134%	166%	175%	211%	218%	202%	115%	132%

GLEANINGS

APRIL, 2004 • ALL THE NEWS THAT FITS

PATERSONS NOT A CURSE!

The Australian Honeybee Industry Council said a health alert about honey from the noxious weed Paterson's curse was unnecessarily alarmist.

Food Standards Australia New Zealand warned consumers against eating more than two tablespoons a day every day.

The warning came after the government Commonwealth Scientific and Industrial Research Organization said a study had found high levels of naturally occurring toxins known as pyrrolizidine alkaloids in honey made from Paterson's curse.

Exposure to these alkaloids over a long period can cause liver damage.

Australian Honeybee Industry Council executive director Stephen Ware said Paterson's curse accounted for less than 10% of the total honey crop and was always blended with other honey.

Ware said there had been no cases of people developing health problems from Paterson's curse honey. He said the jury was still out on whether it posed a human health risk.

"Beekeepers traditionally eat a lot of honey and they're not dropping dead," he said. "We agree we're better off to be safe than sorry but the scientific community is by no means unanimous."

Patterson's curse, also known as Salvation Jane has been a lifesaver for beekeepers in New South Wales and Victoria after the worst drought in more than a century.

A sudden rush of growth with the weed has been producing nectar for honey along with a protein-rich pollen that has allowed beekeepers to increase their bee numbers.

Alan Harman

BEES MOVE GM POLLEN

Australian weed experts sprayed thousands of honey bees with florescent yellow and pink paint to determine the risk of cross-pollinating herbicide-resistant genes.

The scientists at the Weed Management Cooperative Research Center and Adelaide University said their two years of research showed honey bees can travel up to two kilometers between canola fields as they seek fresh pollen.

"We wanted to see how far bees move between herbicide-resistant canola crops and non-resistant crops to determine their spread of pollen," Weed Management CRC researcher Jeanine Baker said.

"If bees are moving a lot of pollen between these crops, then we run the risk of transferring herbicide-resistant canola, which is more difficult for farmers to control and which effectively becomes a weed."

To answer this question, the researchers sprayed thousands of honey bees with the florescent paint at an experimental canola farm at Adelaide University.

Then, 24 hours after spraying, the bees are netted and placed under a microscope to detect traces of the paint. The researchers said this showed 6% of the bees had moved between canola fields with 1% traveling up to two kilometers from the original crop.

"There is the potential for honey bees to move pollen between fields and when the flowers are patchy they move further in search of food," Baker said. She said research confirmed the risk of cross-pollination, though low, was there and could be reduced by strategic placement of hives. She said beekeepers concerned about bees moving herbicide-resistant gene should move hives to areas that are flowering heavily so the bees remain in that area.

Alan Harman

Mark Winston
FRED RATHJE AWARD WINNER

Mark Winston is a world recognized bee research scientist who has worked in a number of areas including pheromones, bee behavior and management, receiving numerous awards for his research.

In the field of teaching he has made an important contribution to beekeeping education by teaching undergraduate courses at SFU as well as training numerous graduate students. He has written a huge number of scientific and popular articles on many aspects of beekeeping, and has a regular feature column in *Bee Culture* magazine.

He has written several books on bees and beekeeping management, has organized and run the SFU Bee Masters beekeeping course, and was the Chairman of the Program Committee for Apimondia '99. He has presented at every provincial beekeeper association meeting and CHC and at international and national beekeeper and scientific meetings throughout the world.

He started the Canadian Bee Research Fund and worked for several years to promote the fund and encourage donations.

Throughout his career he has supported the Canadian industry through his work on CHC committees, his organization of national meetings and his work with the Gov't of Canada.

APPOINTMENT OF GENERAL SECRETARY

Claire Waring has been appointed General Secretary of the British Beekeepers' Association. She is the first woman to hold this post and the first to follow her husband in the job. Adrian Waring was General Secretary from 1994-1999.

Elected to the BBKA Executive Committee in March 2000, Claire served as Chairman of the Publicity and Promotions Committee until 2002. In 2003, she became a member of the Finance Committee. She holds the BBKA Preliminary and Intermediate Certificates.

In 1997, Claire was appointed as Editor of *Bee Craft* and has been largely responsible for introducing the changes to A4 and full colour which led to the magazine being awarded the Bronze Medal for Beekeeping Journals at the 2003 Apimondia Congress in Lubljana, Slovenia. She will continue in this role.

Outside of beekeeping, Claire runs her own publishing and communications company, Buzzwords Editorial Ltd, and her other interests include photography (particularly bees!) and foreign travel.

AAPA STUDENT WINNERS

Nick Aliano was the winner of the student paper competition at the 2004 American Bee Research Conference held in San Antonio, TX. Nick is a M.S. student at the University of NE. His advisor is Dr. Marion Ellis. Nick's graduate research centers on developing strategies for using inert dust to remove *Varroa* mites from honey bees. He also has examined factors that contribute to mite fall from adult bees and the effect of inert dusts on honey bee brood. He will defend his M.S. thesis in August 2004 and plans to pursue a Ph.D. in apiculture at the University of NE.

Katie Bohrer was the winner of the 2003 AAPA Research Scholarship Award. Katie is an undergraduate student at the University of MD. Katie has worked as a Biological Science aide at the USDA-ARS Bee Research Laboratory in Beltsville, MD over the past two years with Dr. Jeff Pettis. Katie has assisted with research on the small hive beetle, queen health issues and *Varroa* control. Katie has pursued an independent research project to understand "washboarding" behavior in honey bees. It is this research for which she applied for and won the AAPA scholarship award.

From IBRA

FREE COPY

A pdf download of the latest edition of *BeeWorld* magazine is available on the web from IBRA. Take a look. It's free. The IBRA website is www.ibra.org.uk.

NUMBERS

54% of our readers belong to a local beekeeper association. 42% belong to their State beekeeping association while 20% belong to Regional or National associations.

When it comes to multiple memberships, 74% of State members are also local members, and 82% of National members are also State members. And 64% of National association members are also members of local associations. Interestingly 16% of National members belong to neither state, regional or local groups, and virtually all of them have more than 300 colonies.

ABF SCHOLARSHIPS

The Foundation for the Preservation of Honey Bees, Inc. is a charitable research and education foundation sponsored by the American Beekeeping Federation, Inc.

The Foundation Trustees offer five $2,000 scholarships to graduate students in apiculture with the stipulation that a portion of the funds be used to attend the 2005 ABF meeting in Reno, Nevada, to present their research.

Applications for the scholarships will be accepted until June 1, 2004. Applicants should submit a cover letter from their advisor, a curriculum vitae and a research summary (not to exceed 3 pages) to the Board for consideration. The research summary can cover research completed within the past 12 months or proposed research that will be completed prior to the American Beekeeping Federation meeting. Recipients will be selected in June of 2004.

Send scholarship applications to: Dr. Marion Ellis, University of Nebraska, Department of Entomology, 202 Plant Industries Building, Lincoln, NE 68583-0816.

INSTITUTE TO STUDY PESTICIDE EFFECTS ON POLLINATORS

Recently, Dr. Dan Mayer, Dr. Jerry Bromenshenk, and Dr. Colin Henderson at the University of Montana formed an institute to continue and enlarge on their previous work on the effects of pesticides and other toxic chemicals on bees. Together, they have some 80 years research and extensive experience on pesticides and environmental effects on bees and plant communities.

The institute incorporates both laboratory and field research designed to meet rigorous scientific and analytical standards. They conduct both laboratory and field research on the effects of pesticides on bees and conduct research following EPA protocols and Good Laboratory Practices (GLP). The laboratory and research facilities employ state of the art technology and equipment. They have the capability and experience to perform research worldwide.

Bee kills from pesticides applied to agricultural crops or forest plantations continue to be a problem for many if not all beekeepers. It is relatively easy to document huge kills that occur periodically. However, research has shown that almost every colony suffers to some extent from pesticides. There is a real need to pinpoint these problems for the health of the beekeeping industry. There is a need for more research on the effects of pesticides on bees. Due to budget constraints at University and Federal Labs, the University of Montana is the only laboratory with extensive experience and capabilities to conduct this research and properly disseminate the information to beekeepers and policy makers.

The bee caution statement on the pesticide label, the interpretation of that statement and the research necessary to generate that statement has become a hodgepodge of a shaggy dog story. There is a real need for credible leadership from the beekeeping industry and the scientific field to deal with this issue at the state and national level. These issues have been mired in the mud for several years now.

OBITUARIES

Dr. Bennie C. "Ben" Blake

Indiana Beekeeper's Association (IBA) co-founder Ben Blake of Valparaiso, after a long battle with cancer, passed away November 28, 2003 at his residence. He was born April 25, 1948 in Mulhenburg County, Kentucky to Claude and Marjory (McIlwain) Blake. Ben was a graduate of Indiana and Wright State Universities where he earned his medical degree. Ben also was active in the U.S. Navy Reserve as a Commander, a Veteran of the U.S. Army, and a member of the American College of Surgeons.

As one of the co-founders of the IBA, Ben emceed the first IBA state meeting which was held at Indiana University-Northwest at Gary in early 1998. Later he generously supported the IBA Young Beekeeper of the Year program. He also served as president of the Northwest Indiana Beekeepers Association for several years until failing health forced him to leave that position. His associates remember him as a promoter of improved methods and techniques of beekeeping among other fine attributes.

L.E. "Moon" Mullins

The third of 12 children, Loris Eugene Mullins was born and raised in Jolo, West Virginia, to Paul Lee Mullins and Theresa Wyatt Mullins, on April 16, 1932. he was known as "Gene" to many and as "Moon" to many others.

Gene attended Jewell Elementary on Bradshaw Mountain, and McDowell County Vocational School, in Welch, WV, and graduated from Iaeger High School in 1955.

Gene joined the Navy and traveled abroad and was given the nickname "Moon" by fellow sailors. He served during the Korean conflict, and made his home in California, where he met and married Shirly Baker. They had two sons, Michael and Douglas.

After the death of his parents he moved to Belmont, NC and later started keeping bees, which became a favorite pastime. He applied himself to learning about beekeeping, involving others, and improving methods. He designed and produced frame holders, pail purches, and hive carriers for various bee supply companies.

Moon was award NC State Bee Person in 2003.

Paul Balashek

Paul Balashek, age 85, died suddenly January 19 on his beloved farm.

Paul was born on December 2, 1918 in Newark, NJ, son of the late William and Suzanne Onufer Balashek. He was predeceased by his sisters, Helen and Ruth.

As a teenager, Paul loved nature and came to upstate NY summers to work on a farm. He was a great lover of birds and bees. He loved raising his cattle and making honey from his apiary. He also shared an antique business with his family. Paul was fondly knows to many as the beeman. He belonged to a bee club and gave many lectures on how to become a beekeeper. Paul defended his country serving in the Signal Battalion during World War Ii and had been a member of the Reasselaerville

American Legion Post #589 for 44 years. While stationed in England, he met his wife-to-be, Jean and brought her back to America.

Paul is survived by his wife of 59 years, children, Sandra and Corey, sister Margaret Korzen and brother Steven Balashek.

HONEY TREES FOR FLOOD PLAINS

Agriculture Secretary Ann M. Veneman announced that the sign-up for a Conservation Reserve Program (CRP) initiative to restore up to 500,000 acres of floodplains by planting bottomland hardwood trees on private lands, authorized by the 2002 Farm Bill. "This is an unprecedented opportunity to help improve our environment through the sequestration of over one million metric tons of greenhouse gases," said Veneman. "This initiative will help restore critical wildlife habitat, while improving water quality and reducing the impacts of floods."

"States are allocated specific amounts of acreage based on their pro-rata share of eligible acreage to ensure nationwide protection of vital floodplains," said Deputy Agriculture Secretary James Moseley during a visit to Riva Ridge Farm that commenced two days of visits in Mississippi which also featured stops at Alcorn State University. "While farmers and ranchers within most states may be eligible, the initiative is targeted toward areas in the Mississippi, Missouri and Ohio River valleys and the southern coastal plain." Bottomland hardwoods are streamside forest trees, including oak, maple, ash, cypress and tupelo. These trees grow generally on lands that are periodically flooded. The initiative will protect against future flood damage by slowing the flow of water and shoring up soil. Each enrolled site will be restored to an ecologically diverse forest type. Eligible land must be located within a 100-year floodplain, comprised of primarily wetland soils and adjacent to permanent rivers and streams. States are allocated specific amounts of acreage based on their pro-rata share of eligible acreage, which will ensure nationwide protection of vital floodplains. While farmers and ranchers within most states may be eligible, the initiative is especially targeted toward states in the Mississippi, Missouri and Ohio River valleys and the southern coastal plain.

The breakdown of allocated acreage per state is as follows: State State Acreage Allocation State State Acreage Allocation Alabama 5,000, Nebraska 10,000, Alaska 0, Nevada 0, Arizona 0 New Hampshire 300, Arkansas 20,000, New Jersey 150, California 4,000, New Mexico 0, Colorado 150, New York 900, Connecticut 300, North Carolina 23,000, Delaware 150, North Dakota 1,000, Florida 450, Ohio 8,000, Georgia 2,000, Oklahoma 1,000, Guam 0, Oregon 2,000, Hawaii 400, Pennsylvania 5,000, Idaho 450, Puerto Rico 150, Illinois 75,000, Rhode Island 0, Indiana 12,000, South Carolina 2,000, Iowa 68,000, South Dakota 3,000, Kansas 24,000, Tennessee 23,000, Kentucky 5,000, Texas 5,000, Louisiana 30,000, Utah 150, Maine 150, Vermont 150, Maryland 900, Virginia 600, Massachusetts 150, Washington 2,000, Michigan 4,000, West Virginia 2,000, Minnesota 17,000, Wisconsin 5,000, Mississippi 50,000, Wyoming 600, Missouri 75,000, Reserve 10,000, Montana 900, Total 500,000.

Program participants will receive 50 percent of the cost to establish the trees, an annual rental payment for 14 to 15 years, and technical assistance to plant the trees. Participants will also retain their right to sell or market their carbon-sequestered gains (often referred to as credits) that are produced from bottomland hardwoods, or other environmental credits, to energy companies or whomever they choose. Sign-up for the hardwood tree initiative is on a continuous basis, meaning eligible land may be enrolled at any time beginning Dec. 1, 2003 at local Farm Service Agency (FSA) offices. Additional information on the hardwood tree initiative and other CRP programs is available on FSA's Web site at: http://www.fsa.usda.gov/dafp/cepd/crpinfo.htm.

Display Advertisers

Maybe Not So Smart

A Gary Shilling

I think I'm an experienced beekeeper, but that doesn't make me a smart beekeeper To wit.

Some time ago, my wife and I were in northern California on several missions. We started with a delightful visit with our daughter and her husband – they were married just last June – at their house in San Francisco on a Thursday evening and Friday morning. We ended up Saturday in Sonoma County, one of the great wine areas north of San Francisco, at a mini-reunion of my 1959 class at Amherst College. That gathering of about 50 classmates and wives was a warm-up for our 45th reunion next month in Amherst, MA.

In between, we visited friends who own and operate a premium vineyard and winery in Napa County – Rutherford, to be exact. We had a delightful time touring their winery and staying with them in their lovely Mediterranean-style house in the vineyard. We also enjoyed an excellent dinner with this couple, their daughter and her boyfriend in a pleasant French bistro, complete with our hosts' excellent wine.

They had received a jar of my bee's honey earlier, so the evening's conversation touched, naturally, on beekeeping. Last June they bought two beehives that were placed in the vineyard. They had yet to find a beekeeper to manage the hives and, meanwhile, were relying on periodic checks by someone from a local nature preserve.

Well, here we were, in the lap of luxury with all this great food, terrific wine and endless hospitality. The least I could do was offer to examine the hives, especially after they told me they bought bee suits when they purchased the hives. Besides, how could I shrink from the challenge, having spent more of the evening than I should have articulating my awesome knowledge of beekeeping and pointing out the crucial dangers of nor properly tending beehives.

Saturday morning after breakfast, we walked the short distance from their home to the winery, and their staff located the bee equipment. It consisted of several veils with helmets that keep the bees away from your face, and beekeeper coveralls in the traditional white, which seems to disturb the bees less than colors. So far, so good.

But the veils were the older type that are held close to the bee suit by strings around the waist. With these, it's much easier for the bees to get up underneath the veil and attack your face than with the newer type, which I use, that zips directly to the bee suit. Those girls know a good target when they can get to it. Also, the suits were medium size, which left my long legs exposed at the ankles. Worse yet, they had no smoker.

My wife suggested that I beg off the hive examination because of the lack of proper equipment, but how could a rough, tough beekeeper like me worry about a few stings? The four of us proceeded to the hives and I opened the first one while my wife and our hosts stood at a safe distance. I pulled out the frames and showed then the eggs, larva and sealed brood in the pupae stage as well as the stored pollen and honey. That hive was in fine shape. But with no smoker to quiet them, the bees were getting increasingly ornery. As I reassembled the hive, they found my Achilles heel – well, close enough for bees. My ankles, covered only by dress socks, were an easy target.

By this time, I'd received numerous stings there plus a dozen or so on my neck and face, but macho me proceeded to open the second hive. Sheer pain, however, necessitated a 100-yard dash across the field as I tried to elude my attackers, slapping away at my legs in mid-stride. I returned only to close up that hive before beating a hasty retreat.

Obviously, I couldn't tell our hosts of my agony and luckily we were scheduled to leave for Sonoma promptly. My wife drove while I winced in pain from about 50 stings on each ankle. It could have been much worse, but being late in the beekeeping season, my previous stings had built up some immunity I had my wife stop at a supermarket for a gallon of ammonia, which acts as a local anesthetic.

I was feeling much better when we arrived for a wine tasting lunch at a fine winery, hosted by our class president who is a Presbyterian minister but went into winemaking later in life and is now retired. But by 3:00 p.m., after a walk in the vineyard, my ankles were swelling and I was feeling light-headed. Luckily, a number of my classmates present are MDs, and I consulted one, a retired Air Force officer who took a personal interest in my plight. He suggested ice packs, which I applied as soon as we returned to our hotel room. The other guests hotel wondered why I raided the ice machine to fill waste