Bee Culture

JUNE 2005
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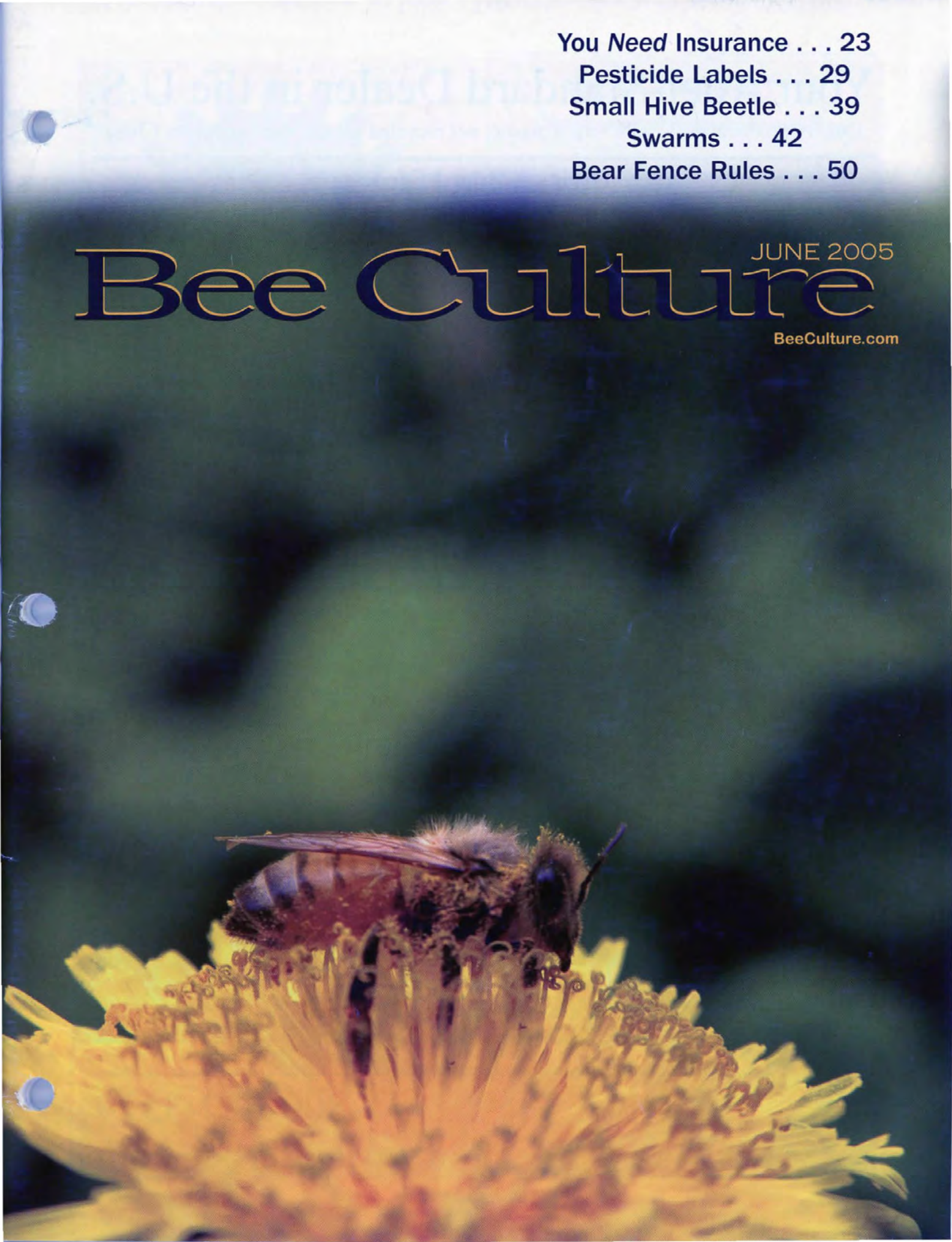

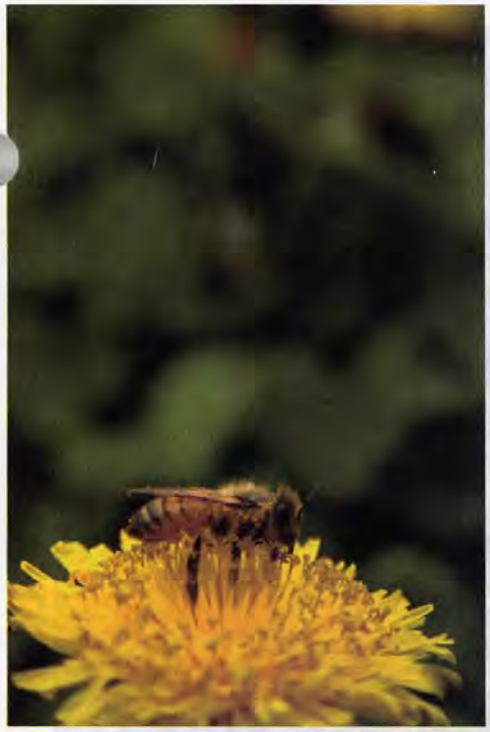

Dandelions. The perfect Spring-time tonic. (photo by Wm. Mondjack)

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

JUNE 2005 VOLUME 133 NUMBER 6

FEATURES

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MAILBOX

Lessons From CA

In response to the reports of heavy bee losses in California, Bart Smith of the Beltsville Bee Lab visited seven beekeeping operations around Oakdale, California from January 30 to February 3, 2005. Six of the operations had originated in North Dakota, Washington, Oregon, Minnesota, and Idaho and had traveled to California for almonds. One operation was from California. Bart, a former Maryland apiary inspector, inspected numerous colonies, deemed either "strong" or "weak," and collected a total of 144 samples of about 100 adult bees each. After transport back to Beltsville, all samples were examined for *Varroa*, tracheal mites, and *Nosema* and nine samples were examined for six different viruses.

We were unable to link any specific disease or malady to the colony losses. Except in one instance, there was no statistical correlation between the strength or weakness of the colonies and the number of *Varroa*, tracheal mites, or presence of *Nosema* (or any interaction of these parasites). The one exception was an operation where high tracheal mite levels were associated with weaker colonies. This relationship, however, cannot be considered strong as the other six operations did not show an association between tracheal mites and weak colonies. As to the contribution of viruses to colony collapse, additional samples will need to be examined before any conclusions can be drawn. While several viruses were detected in the nine samples examined, they were found in both strong and weak colonies.

Though we were not able to *statistically* associate the presence of *Varroa* with colony decline in the samples collected, we feel *Varroa* levels have contributed to the problem. Anecdotal reports of high *Varroa* levels during 2004 and the reported difficulty of controlling *Varroa* with existing miticides leads us to this conclusion. Another factor, poor food resources (reduced honey crops, reduced pollen sources) as a result of drought, was reported during the Summer and/or Fall of 2004 in some parts of the country. Together, *Varroa* and poor nutrition would impact fall brood rearing and the production of young bees for overwintering. This would result in the dwindling of overwintering colonies in the Spring as the older bees fly off and die.

Our results from California emphasize the difficulty in determining what is responsible for colony collapse. The presence of parasites and disease, when assessed in a single, one-time examination, unfortunately does not appear to be useful in determining the cause of collapse. Clearly, what is really needed is a better way of assessing overall colony health; that is, "What constitutes a "strong" colony?" Mere numbers of bees in the Fall are obviously not a sufficient predictor of the likelihood of that colony surviving the winter The problem of assessing overall colony health, however, is complicated. One must take into account the presence of parasites and diseases, their levels, the nutritional status of the bees, and the health of the queen. Ideally, we would like to develop some type of 'marker' of bee health and age that could be used when examining colonies in the Fall to determine the likelihood of those colonies successfully surviving the Winter *and* being productive the following season.

Mark Feldlaufer
Beltsville, MD

Dr Feldlaufer is the Research Leader of the USDA Honey Bee Research Lab in Beltsville. Ed.

Ladino Clover Forage?

As a subscriber to *Bee Culture* I was hoping you might have a moment to answer a question. Do honey bees forage on Ladino Clover? I'm planting some this Spring here in Massachusetts and use it mostly for plow down cover crop. If my honey bees will forage it then it will be left to grow through bloom. I have the book, *Honey Plants of North America* by John H. Lovell, but he doesn't mention it. I hope your readers have some input.

Vincent Lenza
West Tisbury, MA

Api Life Var

There is an approved product, which will kill approximately 95% of your *Varroa* Mites no matter what chemicals they are resistant to! It is easy to use, inexpensive, leaves no harmful residue and has been used successfully across the world for 15 years. The name of this product is *Api Life VAR.*

You must treat each colony three separate times at 7 to 10 day intervals. For each application you must break one wafer and place ¼ of a wafer on top of your brood frames on the perimeter of the brood nest in four places. What is better: to lose your bees and impregnate your combs with poisons that will affect you for years, or visit your colonies three times in 21 to 30 days, kill your mites, and leave no harmful residue?

The primary active ingredient is pure crystalline Thymol, which is combined with eucalyptol, menthol, and camphor, all natural ingredients. This formulation of Thymol is not the essential oil Thymol but a purified crystalline form of Thymol. It is manufactured in one laboratory in Europe and they will not sell it to the public. This crystalline form of Thymol creates a gas, which greatly reduces the residues absorbed by

Continued on Next Page

MAILBOX

the comb. Thymol is naturally occurring in honey and will not cause any problems for your queens or bees. In all tests of products with Thymol as the active ingredient **Api Life Var** has out-preformed all other formulations because of this stronger form of Thymol. **Api Life VAR** will not harm your drones, will not kill your brood, will not affect the queen. Most importantly it is safe for you to use. All of these benefits and it costs less than any other legally approved miticide.

Currently 24 states have a section 18 for this product and it is available in these states immediately. Two more states are on-line and should be approved soon. We have sold this product here for three years with excellent results from all who have tried it.

Over the past 10 years the beekeeping industry has gone from an abhorrence of pesticides to the worst abuser of agricultural chemicals, according to the Florida Department of Agriculture. The bomb will fall shortly on us because of what is being done by those who continue to use these potent chemicals that harm the bees themselves and contaminate the hive products. When this happens, wouldn't it be nice to tell your customers that you treat only with natural miticides? **Api Life VAR** is a product that will work for you, won't harm you or your bees and return honey to that all natural product that it should be.

It would be so easy for you to try a small amount of this and see how it works for you. You will get an effective kill of your *Varroa* mites, leave no harmful residues, and not adversely affect your bees or yourself.

For commercial references, questions, and advice please call 800-233-7929.

Steve Forrest
Brushy Mountain Bee Farms
Moravian Falls, NC

More Sumac Smoke

An analytical chemist did a check on sumac seeds and reported "– think the ingredient that killed the mites was 1,2,3,benezenetriol, also known as pyrogallol. – it's not exactly good for you."

Our home dictionary defines pyrogallol as a poisonous white crystalline phenol produced by heating gallic acid, used in medicine, as a developer in photography. I take this to mean while it's effective for mite control, it's not something we'd like to have for breakfast.

It would be a good idea to remind beekeepers interested in using sumac, it should only be used as any other chemical with possible detrimental qualities, when no honey supers are on the hives. We're now using Sucricide and contemplating trying powdered sugar.

Rachel Kinkennon
Edwards, MO

Still Killing Honey Bees?

While mites have been a major loss factor for American beekeepers, this is only part of the story. We've known this crisis was coming for nearly 20 years and yet little has been done to prepare for or prevent it.

Researchers have done their best, but funds have been very limited. In fact this administration tried to close many of the bee research facilities at a time when they were needed most.

Hundreds of thousands of colonies of bees and millions of dollars in property have been lost to illlegal use of pesticides nationwide and the EPA has fiddled while Rome burned, fully aware of the losses but unwilling to do anything. The EPA has delegated authority for enforcement of pesticide regulation to states and has then failed to hold them to any resonable standards. These state departments of agriculture in turn have have been openly hostile to beekeepers seeking protection from the misuse of pesticides, and again the EPA has stood by and done nothing in the face of repeated violations of Federal Label Laws.

We had 5 to 6 million managed colonies of bees in America in 1950. Today we have fewer than 2 million, with the steepest decline in the past 15 years. States such as Colorado, Nebraska, Washington and others lost over 50 percent of their bees between 1990 and 2000, with huge pesticide losses. States did everything they could to explain away these losses and sweep them under the rug. The EPA fiddled.

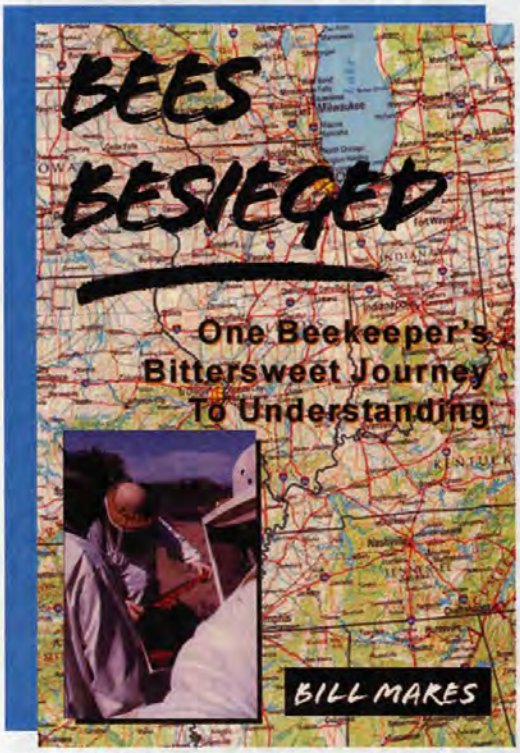
We have been courting this disaster for years and American beekeepers have attempted to sound the alarm, but to no avail. Now the chickens have come home to roost. The mites are just the final blow to an industry already weakened by institutional indifference. If we solve the mite problem and fail to correct these systemic problems, this industry is still dead and Americans may get very hungry.

There is so much talk about homeland security, what could be more important than the protection of our most fundamental need, food? And yet these bureaucrats and politicians have *knowingly* failed to protect our food system. Instead, their inaction, indifference, hostility and incompetence has brought us all to the brink of disaster

Serious changes must come and some heads should roll. We can't go on the way we have.

Let's see some serious investigative reporting of the *whole* problem. Let's see some Congressional Hearings to get to the bottom of this whole inexcusable mess.

Tom Theobald
President, Boulder County
(CO) Beekeepers Association



"*Bees Besieged* by Bill Mares is a fine book for both the experienced beekeeper and those just getting started. Mares has spent years interviewing beekeepers and researchers, and around their stories he builds a well-written narrative that gives an accurate picture of what American beekeeping is like today."

Sue Hubbell,
Author, Beekeeper

"*Bees Besieged* is an in-depth odyssey of beekeeping and beekeepers written by an author who loves the bees. The book is a report of his odyssey. The book will find great appeal to beekeepers because the cast of characters come alive by the author's treatment of the interviews. For the non-beekeeping public this book is a good primer."

Hachiro Shimanuki,
USDA Honey Bee Researcher, retired

"Good humored, timely, well-paced, torrentially informative. I found it fun and fascinating."

Edward Hoagland,
Author, Environmentalist

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The Topics

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SHBs
Cape Bees

Beekeeping Associations

The Future
Chinese Honey
10 Ways To Help
Bee Quotes

Bill Mares' bees died in the Spring of 1996. All of them. Why, was the question. This book is the answer.

To get there, Bill has traveled the U.S. in search of why.

During his Odyssey he captures the beekeeping industry in its glory and in its wisdom, in its innocence, and with its pants down. The very best and the scary worst of our industry lies between these covers. In his pursuit, he paints the whole picture as no one has done before.

Similar books, on coffee and salt, chocolate and bananas, rubber, water and other common commodities have been produced over the years. They have examined their histories and politics, their personalities and the many diverse parts and pieces that lurk unseen just below the surface of every group and product.

Bees Besieged examines, too, these common aspects of the U.S. beekeeping industry – the past, present and even the future, the many personalities that make up this tiny, esoteric, yet still-critical cog of modern agriculture, not only in the U.S., but in the world.

But then it adds those sumptuous extra bits seldom found in less serious, and less traveled stories. That's because *Besieged* looks carefully and critically at the two products of beekeeping – pollination, which is by far the most valuable of the two commodities, and honey, the far more romantic fruit of the honey bee's labors. But it never, ever lets the most important and most interesting ingredient escape from sight – the beekeepers that make it all happen.

Yet, as fascinating and as useful as this knowledge is, the greatest value of this work is the picture Bill creates as he gathers close the people, the problems and the promises from his journey. This snapshot, developed from the perspective of someone who needs honey bees in his life, makes our understanding easier and, perhaps, the troubles less threatening. Even so, though the puzzle may be nearly complete, the driving force remains the link between the common honey bee and the uncommon passion of thousands of beekeepers, Bill included, to just have a few bees out back. This book is as simple, and as complex, as that.

The People

Bill Mraz
Peter Genier
Lyle Johnston
Bob Harvey
William Vanderput
Tom Theobald
Bob Rowell
Paul Taylor
Richard Adee
Judy Gulleson
Dave Green
Dr. Thomas Rinderer
Dr. William Wilson
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Bob Beekman
Kevin Roberts
Tom McCormack
Ann Harman
George Imirie
Jagger Koerner
Tom Chester
Kim Flottum
Mike Palmer
Dr. H. Shimanuki
John Harbo
James Baxter
Dr. Dewey Caron
David Graves
The Wise Guy
& more!

INNER COVER

Good grief, what a mess.

And probably all my doing. Here's the picture. A great Spring last year, but a miserable Summer I harvested early – Memorial Day, and again mid-Summer – July 4th. Absolutely nothing after that. Nothing. Of three colonies, one actually starved before Labor Day. The other two looked O.K. Had enough honey and, it seemed, pollen to overwinter Both queens took a powder some time between labor day and early February. One colony died. One almost did.

Got two packages in early April. They went in fine. Also requeened the survivor Later made a small split of the overwintered colony for an observation hive to be made up later Brood, bees and a new queen for the split. Brood in the other three – not lots, but about right, considering the miserable Winter that wouldn't die we had.

Later: The split's queen is present, but not laying. Nada. Nothing. Zip. Walking around just as proud as you please though. Overwintered colony – queenless, with lots of drone brood. Two packages – one, no brood, no queen. The other, no queen, but some drone brood.

I had four colonies, two worthless queens, no brood, and couldn't find a mail order queen to save my behind. Sometimes, rank has a privilege or two, but it don't mean squat when there ain't any queens, anywhere. No wonder people starting out get frustrated and flounder and can't figure it out.

Good grief, what a mess.

•

I was talking with a honey bee researcher recently who was half-seriously suggesting that the quest for the perfect *Varroa* control was wearing thin. That there were other, important problems to consider, and other curious things to unwind and uncover Both broader pictures and intriguing niches to study and to glean from. Some with *Varroa* as a part of the picture, some not at all. Knowledge, after all, has many facets.

Another researcher expressed a similar view, for a very different reason. The money, it seems, is coming from a different master, and starvation was certain on a *Varroa*-only-control diet.

Varroa fatigue, it appears, is setting in. I know exactly what that is. I'll bet you do, too. I want to just keep bees, not gain a degree in acarology. But everything I do is keyed to control *Varroa*. Everything. Screened bottom boards. Disease reduction. Monitoring and measuring the whole number of mites all the time. Chemicals, hard and soft. Brood removal. Resistant bees. Tougher bees. Better bees. To little or no avail, however *Varroa* is still winning.

I can keep doing it though. It's a mind set thing. Management. Win most, lose some. Sometimes more than others. 30% isn't the end of the world, after all (see the Honey Price Report on Bee Loss survey results). But it's 30% because those research people keep throwing things at us to try. If they didn't, it'd be worse.

If you look at it, pretty much a whole generation of beekeepers, and honey bee researchers have spent their professional lives trying to keep up. Trying to overcome this tiny pest. And succeeding right about 70% of the time. Often far less. Seldom more.

The danger flag, of course, is that the money isn't on *Varroa* anymore. It's on multiple-pest IPM strategies. It's on molecular genetics. It's on sublethal effects of environmental toxicants. Like apples, it's no longer just codling moth, but on the seasonal lepidopteron pest complex. It's not on *Varroa*, but on the reduced quality of pollination due to low, medium and high levels of *Varroa*, coupled with low, medium and high levels of small hive beetles, *and*, with and without old comb.

And nutrition is coming back into focus. Better feed, or more feed, or the same feed better timed.

All of these are, actually, exciting. I hope the multilayered problems and questions are resolved. And maybe 70% isn't so bad. That was a passing grade, back when I was in high school.

We kind of have two choices, don't we? Either run fewer colonies, better, using all those soft chemicals, mechanical IPM techniques, and keeping stress to a minimum; or, run a whole lot more, with the expectation of losing 30, 40, 50% every year And accept that as the cost of doing business. It's doable, if you budget and plan for it. And get it.

•

Summer meetings. I love 'em. If you haven't tried one yet get out of your rut and get going. For one thing, you won't get stuck in an ice storm or a blizzard. The livin' is easy in the Summer time.

The Heartland Apicultural Society meeting is in Edwardsville, IL, July 7-9, for those in the middle. WAS, the Western Apicultural Society meeting is in Moscow, Idaho, July 20-23 if you're out west, and the Eastern Apicultural Society meeting, August 1-5 in Kent, Ohio, is sure to please everybody in the east, and perhaps beyond.

You want to know what's going on, you gotta be at one of these. Absolutely.

Kim Flottum

Messy, But Getting Better

Powder Sugar Roll For Varroa Mites on Honey Bees.

University of Minnesota Instructional Poster #155

Gary S. Reuter and Marla Spivak, Department of Entomology

To keep your honey bee colonies healthy, it is important to determine the level of varroa mites in your colonies. This method provides a good estimate of the number of varroa mites on the adult bees. This method has the advantage of not killing the bees.

1. The first step is to make a container with a cover made of 8x8 hardware cloth. An easy method is to use a wide-mouth canning jar. Use a ring type cover. Cut a circle of 8x8 hardware cloth the size of the cover that fits in the ring and use it instead of the cover.

2. You will also need something white to shake the mites and powdered sugar into. You can just shake them onto a piece of paper if it is not windy. A white container works best but any light color (yellow) would be ok.

3. Shake about 200-400 bees into the container. You can see we shake the bees from a frame into a bent piece of sheet metal (flashing) to help pour them into the container.

4. 1 fluid oz. = approximately 100 bees. 1/4 cup = approximately 200 bees. You will have to shake the bees in, then tap the bottom of the container to get all the bees on the bottom of the container to measure them.

5. With the bees in the container place the 8x8 screen on top and secure.

6. Put about 2 Tablespoons of powdered sugar into container.
Shake the bees with the powdered sugar until they are well coated. Let the container sit for about 1-2 minutes.

7. Tip the container upside down over the white container and shake the powdered sugar and mites out through the screen.

8. Continue to shake for at least one minute to be sure you have all of the mites.

9. Count the number of mites in the powdered sugar. If you have trouble seeing them you can add a small amount of water to dissolve the sugar, making the mites easier to see.

10. This is what the mites look like that you are trying to see.

11. Return the bees to their colony.

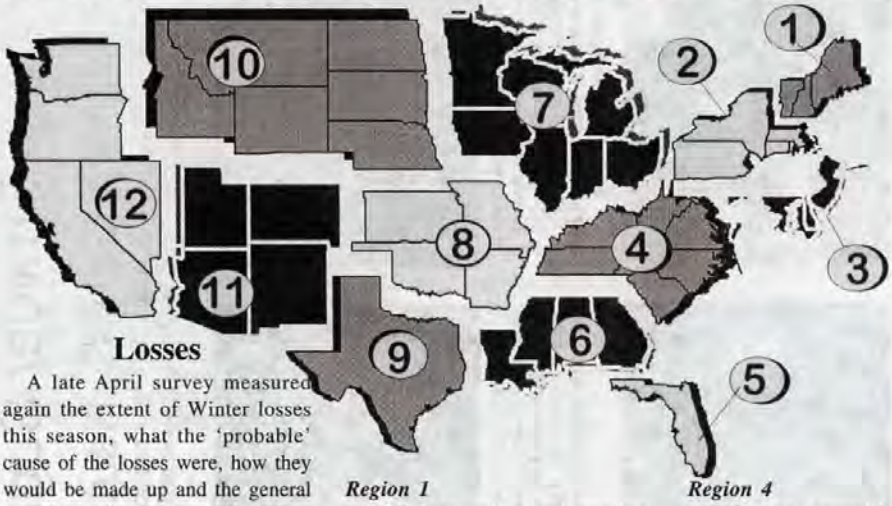
12. The bees will survive. Once they are cleaned up they can go back to work.

Collect bee samples carefully: You need to know the number of bees you have fairly exactly. The quarter cup = 200 bees is a good consistent number to collect. Gather these bees from the brood nest frames, being careful to *NOT* gather the queen.

If you know how many bees you collected you can estimate the number of mites/100 bees (*NOT* mites/sample). For instance, 10 mites found in the sugar would = 10 mites/200 bees, which = five mites/100 bees. Reasonable estimates are that where there is brood in a colony the number of mites/100 bees is actually **double** the number collected. Thus, the estimated number from this example would be 10 mites/100 bees.

Researchers suggest that 10 mites/100 bees is the level that requires treating, so 2x/month sampling is recommended.

JUNE – REGIONAL HONEY PRICE REPORT



Losses

A late April survey measured again the extent of Winter losses this season, what the 'probable' cause of the losses were, how they would be made up and the general condition of colonies at that time.

Overall, losses by our reporters were 30.1%. Northern regions – 22% in January, 30% in April; Southern – 20% in January, 35% in April; Central – 19% in January, 26% in April; West – 33% in January, 36% in April. So losses continued after January, as expected, with every region except the west suffering considerably more.

What caused the losses? Mites – say 65% of our respondants; starvation – 17%; queen failure – 8%; the weather – 6%; SHB and pesticides – 2%. To replace – packages – 26%; splits – 60%; buy nucs – 14%. Conditions now (very weak = 1, OK = 2, average = 3, strong = 4 and buster = 5) averaged 2.9, just below average.

Region 1

22% loss; mites and weather; mostly packages to fill in; conditions = 2.0. Demand steady for last years crop.

Region 2

48% loss, mites, starvation, weather and queens were the rank of causes; mostly splits, then packages to fill; conditions = 2.4. Demand steady to increasing.

Region 3

33% loss; caused by lack of food and mites; mostly packages to fill, but conditions now = 3.5. Demand steady.

Region 4

25% loss, caused by mites and bad queens; packages and splits to fill; condition = 3.1. Demand exactly steady.

Region 5

49% loss, caused by mites. Splits to fill, conditions = 2.2. Demand steady.

Region 6

31% loss caused by, in order SHB, mites and starvation. Splits, packages and nucs to fill, conditions = 2.8. Demand strong.

Region 7

33% Winter loss, caused by weather, starvation, mites, and lost queens. Replacements by splits, and overall condition = 3.6. Demand steady.

Region 8

19% Winter loss, caused by starvation, lost queens and mites. Replacements by splits, mostly Condition = 3.0. Demand increasing slightly.

Region 9

26% Winter loss caused by mites, poor queens and some sprays. Splits for replacements, and overall condition = 3.1. Demand increasing.

Region 10

16% Winter loss caused by mites, starvation and stress from lots of moves. Replacements by splits, some packages. Condition = 3.0. Demand barely steady.

Region 11

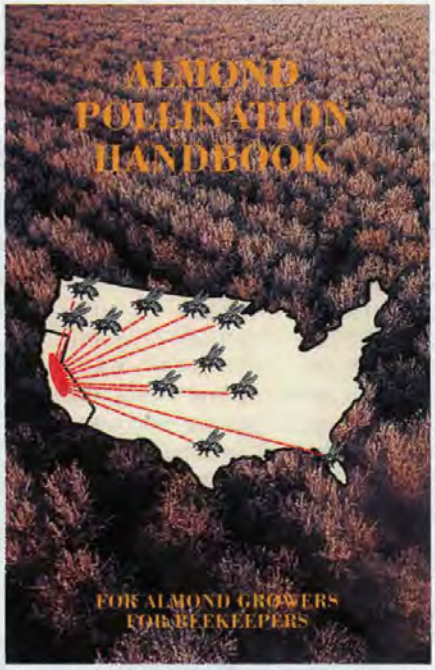
34% Winter loss caused by mites, starvation and lost queens. Replacements by splits and packages. Condition = 3.3. Demand steady.

Region 12

Winter loss 37%, all due to mites, Splits to replace. Condition = 3.0 and demand increasing slightly.

	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	1.02	1.00	1.02	1.15	0.93	0.88	1.13	1.02	0.75	0.80	1.25	1.15	0.75-1.25	1.01	1.12	1.39
55 gal. Amber	0.90	0.75	0.95	1.05	0.69	0.87	1.01	0.95	0.68	0.80	1.10	0.98	0.68-1.10	0.89	0.96	1.12
60# Light (retail)	97.00	112.56	114.20	98.15	102.33	117.50	102.93	103.33	120.00	115.00	137.50	115.00	97.00-137.50	111.29	110.73	106.74
60# Amber (retail)	96.67	107.52	102.72	95.90	80.42	100.00	97.17	105.00	110.00	102.72	135.00	102.72	80.42-135.00	102.99	109.30	102.79
Wholesale Case Lots																
1/2# 24's	40.19	43.58	43.26	37.80	59.04	37.50	41.64	43.26	43.26	35.76	30.00	43.26	30.00-59.04	41.55	38.68	40.36
1# 24's	58.28	59.66	64.81	55.84	47.92	56.10	60.69	62.40	53.20	71.84	74.90	67.60	47.92-74.90	61.10	61.02	62.89
2# 12's	57.05	57.84	57.63	51.95	60.12	48.00	54.36	66.00	48.33	55.92	41.50	61.50	41.50-66.00	55.02	54.71	51.06
12 oz. Plas. 24's	52.61	53.90	54.52	56.35	58.96	48.00	49.36	51.60	51.70	47.76	70.80	55.20	47.76-70.80	54.23	52.84	51.27
5# 6's	56.53	65.33	64.86	56.42	64.86	60.00	60.81	50.00	50.00	56.43	58.00	72.00	50.00-72.00	59.60	60.71	56.10
Quarts 12's	72.00	100.35	82.66	80.56	69.82	69.33	83.66	76.00	80.67	99.80	84.20	96.00	69.33-100.35	82.92	80.93	82.11
Pints 12's	48.00	49.95	55.45	54.00	43.60	46.67	50.86	44.00	45.17	49.50	55.00	54.00	43.60-55.45	49.68	50.02	46.55
Retail Honey Prices																
1/2#	2.42	2.26	2.46	2.81	2.40	2.59	2.40	1.84	2.02	2.66	3.00	2.50	1.84-3.00	2.44	2.37	2.69
12 oz. Plastic	3.05	2.84	3.22	3.24	3.22	3.25	2.99	3.47	2.95	3.06	3.35	3.18	2.84-3.47	3.15	3.20	3.18
1 lb. Glass	3.48	3.12	3.91	4.08	3.59	3.75	3.62	4.17	3.50	3.85	4.36	4.03	3.12-4.36	3.79	3.91	3.88
2 lb. Glass	6.75	6.28	6.29	5.85	6.23	6.99	6.41	7.87	5.41	6.13	5.94	7.17	5.41-7.87	6.44	6.43	6.26
Pint	5.13	6.08	6.40	5.74	4.65	5.11	5.33	5.41	5.00	6.24	5.31	5.99	4.65-6.40	5.53	5.90	5.55
Quart	8.88	8.55	11.47	8.02	8.10	8.88	8.91	8.43	8.38	11.83	8.56	10.37	8.02-11.83	9.20	8.48	9.05
5 lb. Glass	12.45	13.43	13.28	13.17	15.00	12.75	13.55	15.99	9.50	13.48	13.59	15.99	9.50-15.99	13.51	13.25	12.53
1# Cream	4.75	4.70	5.44	4.74	5.00	3.75	4.86	4.64	5.44	4.67	5.53	4.60	3.75-5.53	4.84	5.31	4.46
1# Comb	5.25	4.54	6.75	5.55	6.40	4.17	6.41	4.99	6.75	5.60	6.00	5.50	4.17-6.75	5.66	5.65	5.12
Ross Round	4.75	3.90	4.85	4.95	5.00	3.75	5.36	4.99	5.00	5.63	4.45	4.85	3.75-5.63	4.79	4.86	4.62
Wax (Light)	3.31	3.19	2.41	2.03	1.35	2.38	3.24	2.25	2.48	1.40	1.83	2.50	1.35-3.31	2.36	2.21	1.95
Wax (Dark)	2.75	2.82	1.40	1.79	1.18	2.13	3.55	2.00	2.00	2.37	2.70	2.48	1.18-5.75	1.89	2.01	1.66
Poll. Fee/Col.	55.00	43.00	38.00	37.50	35.83	42.50	43.81	60.00	30.00	50.00	75.00	56.67	30.00-75.00	47.28	51.98	39.06

NEW – FROM CALIFORNIA TO JAPAN



Almond Pollination Handbook, 86 pages, soft cover, color photos. Order from Kovak Books, P.O. Box 1422, Bakersfield, CA 93302. $10 (includes shipping and handling).

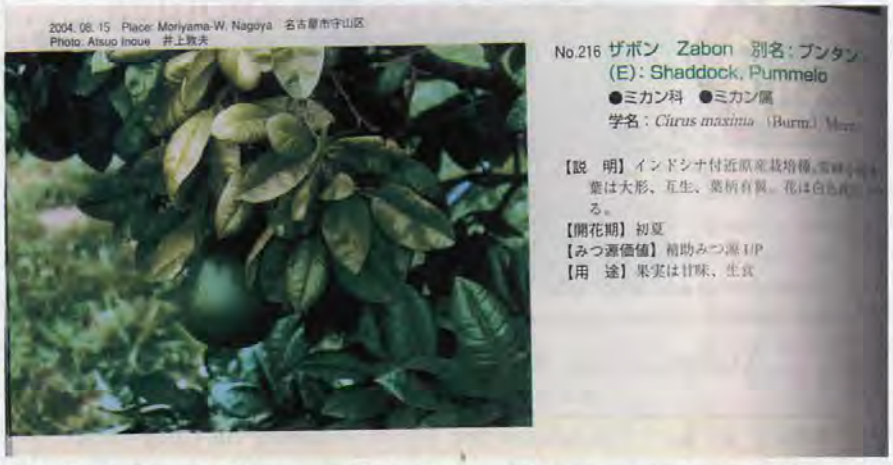
With the current interest in almond pollination this handbook, by Joe Traynor, first issued in 1994 has been reprinted. A two -page update (May 2005) is included with the book.

The Latest Buzz About Russian Queens and Small Hive Beetles, is a new video (DVD) that provides the latest information on combating *Varroa* by integrating Russian queens into colonies. It is now available all across the U.S. for $13.85 which includes U.S. postage.

Dr. Tom Rinderer from the Bee Lab in Baton Rouge is featured, along with other top entomologists and geneticists.

"This 45-minute video is must see for beekeepers, because it provides the latest information on *Varroa* and tracheal mites, along with a segment on the Small Hive Beetle.

Contact Gary Reynolds, 785.243.3619, P.O. Box 363, Concordia, KS 66901.



The Honey Plants of Japan, published by Japan Beekeeping Association. 8½" by 12", all color, hard cover. $80 (sea mail postpaid), $110 (airmail postpaid) from Japan. Available from Atsuo Inoue, P.O. 15 Moriyama, Nagoya City 463 Japan. Send money by International Postal Order.

This gorgeous book is filled with color photos throughout. The copy, for the most part is in Japanese, but the names of the plants are given in English. This is an excellent photo reference for many plants, and would be a good addition to your collection. It has over 300 pages of native and non-native plants.

The Backyard Beekeeper, Kim Flottum, published by Quarry Books, an imprint of Rockport Press. Soft cover, full color inside, 8" x 10", 165 pages. Available from *Bee Culture* Book Store, X141 $25. To order call 800.289.7668 or send check to Root Publishing, 623 West Liberty Street, Medina, OH 44256.

Interest in keeping bees is increasing perhaps from the publicity about the lack of bees. Backyard gardeners who realize that pollination of their crops is lacking are taking beekeeping courses in record numbers. Although a number of books for beginning beekeepers are available, these books are not always suitable. Quite a number are out-of-date, especially with information about disease and pest control. Some are just plain uninteresting to read, poorly illustrated, and some are "teachy"– "do this, do that." So it is refreshing to have a book, modern and up-to-date, attractive, for the beginning beekeeper who wishes to have a few hives for the garden.

The style throughout the book is delightful and unusual. The author is having a conversation with the reader. In this way beginning beekeepers can feel that someone experienced is looking over their shoulders and guiding them into becoming beekeepers.

A 9-to-5 job plus tending to house and the garden itself leaves little time for yet another hobby, no matter that this hobby is essential to the health of the garden. Time-saving tips are given and emphasis placed where necessary on important tasks.

Readers may be surprised that an assembled, medium-depth, eight-fame hive is recommended for the backyard beekeeper. The beginning beekeeper has a hive that is ready for bees, manageable and will produce an adequate supply of honey. –*Ann Harman*

RESEARCH REVIEWED

Steve Sheppard

" . sometimes it is fun to read or hear the opinions of others (on how to keep bees) just to recognize how wrong they are – since we all already know the best way to keep bees . . right?

The typical format of this column is for me to review one or more scientific papers on various aspects of honey bee biology and then to write a condensed description of the work for readers of *Bee Culture* magazine. This month I would like to approach the column in a different way and write instead about how reading articles and books on apiculture and other aspects of honey bee biology can make you a better beekeeper in a way you might not expect.

More than 30 years ago, I started keeping bees and, as is typical with certain excitable beginners, built up my apiary to around 30 colonies within a couple of years. My initial learning experience was limited to exposure through a university beekeeping course and a 1920 edition of the *ABC and XYZ of Bee Culture* that I had inherited from my great grandfather. The latter was a book that I spent many hours reading as a child. However, as part of my beekeeping affliction, I also bought all the typical "beginners" beekeeping books published by the major bee equipment companies at the time and read them thoroughly. My initial reaction was disbelief. While much of the information was common among the books, my main impression was that there were major differences in "how to" keep bees. While I don't remember so many of the details now, I do recall being surprised that there were often completely different recommendations given by these books for how and when to super bees, how to feed bees, how many boxes to use, how to prepare colonies to overwinter, how to prevent swarming and many other topics.

Of course, in hindsight, the reasons for these differences among recommendations in the various books seem unsurprising. There may have been climatic and geographic differences in the regions of the country where the authors kept bees, leading to variation in timing and the efficiency of different methods. However, and perhaps just as importantly, the books probably reflected differences in how the authors themselves were "taught" to keep bees.

Ask advice from a group of beekeepers and you may hear, "**always** use a queen excluder, **never** place an empty super on top of a full super, etc." or "**never** use a queen excluder, **always** place your empty supers on top of full supers, etc" Which is it? Depending on how and where you learned to keep bees – you may have your own opinion on these and a multitude of other topics already. Aha ! – the key word... Opinion. There is sometimes a tendency to speak of opinions as if there was a "right way" to keep bees (*i.e.* "the right way is the way **we** do it"), while in actuality there are many ways to keep bees. Further, beekeepers that follow quite different methods may find that a particular procedure works well for them. So what was the real lesson to be learned from those beginner beekeeping books? If there were so many different opinions on exactly how a single thing should be done, then most likely the "best" way to do something depended on circumstances that were not spelled out nor maybe even known to the authors. To recognize this near the start of my beekeeping experiences broadened the concept of beekeeping from something where a simple set of set rules could be followed to always make a honey crop to a much more interesting vision of beekeeping as an art based on principles of colony organization and health, seasonal life cycles, genetic tendencies and more.

I am writing this column as I return from participating in an editorial meeting for an international scientific journal on bee research. In general, the articles published in the journal reflect contributions from the world community of bee researchers and biologists. However, as part of the discussion on journal subscriptions from various countries around the world, we discovered that over 50 beekeepers in Germany subscribe to this scientific journal. At first this may seem like a strange notion, that beekeepers would subscribe to a relatively expensive scientific journal on honey bee biology. However, on reflection it makes perfect sense. Beekeepers for the most part are passionately interested in honey bee biology Every time a beekeeper opens a hive and spends a few minutes to assess the condition of the brood and queen, the disease status, population size and the stores of pollen and honey, they are in fact studying bee biology. The manifestation of all the complexity of a honey bee society is open before them. The fascination is renewed and careful observation leads the curious to ask even more questions about bee biology. The answers to these questions can be answered, in part, by reading books, journal articles and beekeeping magazines. Interactions with other beekeepers at local and state beekeeping meet-

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ings represent chances to discuss, debate and learn new information that later can be used to improve beekeeping skills.

Getting back to the topic of the "right way" to keep bees. As reader/beekeepers deepen their understanding of honey bee biology, they also broaden understanding of beekeeping as an art based on biology and recognize the limitations of those who imagine only a single "best" way to do many things related to beekeeping. As such knowledge grows, when they later read "how things **should** be done" in beekeeping journals or books or hear the same from "experts" in the field, they will have a basis to judge and sort among the opinions and advice. Of course, sometimes it is fun to read or hear the opinions of others (on how to keep bees) just to recognize how wrong they are – since we all already **know** the best way to keep bees...right? BC

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

Apidologie is an International Journal of bee research that publishes articles, reviews and notes on the biology of bees. The topics of the papers published by the journal include: behavior, pollination, genetics, physiology, toxicology, apiculture and pathology. As the journal has grown, so has the editorial board (going from three in the early 80s) and now includes nine editors that handle the review process for manuscripts. The three U.S. editors are Drs. Stan Schneider, Marla Spivak and Steve Sheppard.

Although the accepted languages for manuscripts are English, French or German (with a detailed summary of each paper also published in the other two languages), almost all the papers are now published in English. Table of contents and abstracts are available to all users (http://www.edpsciences-usa.org).

Apidologie was started originally by the merger of two journals, one French – (Annales de L'abeille) and one German (Zeitschrift fur Bienenforschung). It was the brainchild of Dr. Ruttner (head of the Institut Fur Bienenkunde in Oberursel) and Dr. Louveaux (gif sur yvette). They added Dr. Shimanuki as a U.S. editor to promote the inclusion of English language papers. Dr. Steve Sheppard took over as assistant U.S. editor for Dr. John Vandenberg in 1988, and Dr. Shimanuki stepped down in 1991-1992. The U.S. editorship went with Dr. Sheppard to Washington State in 1996 and later Dr. Marla Spivak joined. Later, Dr. Shimanuki came on board and that is how it stands now. With three of us in the U.S. and six others on the editorial board – it makes the manuscript load much more manageable.

The Journal has grown in the field as measured by values such as impact factor and now basically is almost an entirely English language journal, although it is possible to publish papers in French or German. Most authors, even in French and German speaking countries prefer the greater exposure of putting their papers out in English.

Members of AAPA get a 49% discount off the subscription price – so it is worth it for anyone that wants Apidologie to join AAPA for $15 (save hundreds!)

Eighteen months after publication, Apidologie articles are available free for reading and downloading at the Apidologie website (U.S. mirror site is http://www.edpsciences-usa.org). Look for the Journal Apidologie (edp publishes many others as well). Some special articles or articles that authors pay extra to publish – will be available free from the beginning. For subscription information contact Eric Mussen at ecmussen@ucdavis.edu.

Mark Winston

Heather

"Heather quietly and modestly runs the research, while the front guys get most of the credit."

I've got Heather on my mind this month, and I don't mean the flower Heather as in Heather Higo, who has been with my research group for almost 20 years, first as an undergraduate student, then as a graduate student, and most recently as the technician in charge of my lab for the last dozen years or so.

Heather has been one of a small but elite group of apicultural technicians working in university and government laboratories who quietly and modestly run research programs while us front guys get most of the credit.

I value Heather deeply as a colleague and friend, and heap praise upon her publicly and privately at any opportunity. Still, even I hadn't realized just how revered and respected she is until I sent out a message to former students asking for any stories or comments about Heather prior to writing this article. The cascade of over-the-top comments and interesting stories that came back was overwhelming, reminding me yet again about the depth and intensity of the relationships we build with each other, stimulated by bees as our common denominator.

Heather grew up here in British Columbia, married soon after high school, quickly had her two children Yvonne and Rodney, and worked side-by-side with husband Gary as commercial fishermen until the local salmon industry began to sink. She returned to university when her children hit their teens, joined my group for a Summer job, and hasn't looked back since.

Adony Melathopolous is one of my former graduate students who currently works as a technician himself for Agriculture Canada. He wrote back about Heather, but also about the unsung role that technicians play in our laboratories: "*I have joked with Heather that she and I should form an association of apiculture technicians, assigned with raising our profile. Technicians are overlooked. Although the scientists we work under lavish us with praise, we don't garnish notoriety in science circles, among beekeepers, or in the press.*

The best technicians are the easiest to miss. They are invisible to most people looking in at a science program. You never notice their role in an experiment because these experiments are frequently seamless. They maintain equipment diligently, their trucks always carry enough smoker fuel, and the small army of staff or graduate students they manage coalesce cheerfully under their leadership.

Heather is highest among our order of technicians. She is the person I think of when I think about how I can do my job better."

Heather's main job as technician has been to keep the bees in good order and help my graduate students with their research, but her real impacts are considerably deeper and broader than her job description. For one thing, she mentors my students, serving as example, mother hen, confidante, advisor, and general calming influence.

Take Nathan Rice's story for example: "*I was only 19 when I started my Master's degree, and for about three months right at the beginning of my project I felt like absolutely nothing was going my way. Every day coming into the lab was torture; I couldn't sleep at night because I felt like I was some kind of fraud and would be found out shortly by the degree police.*

One day a container of liquid nitrogen slipped out of my hands, fell to the ground and shattered irreparably. I yelled an obscenity, stomped around a bit, and stormed out of the lab, seething about the whole situation. I was ready to pack it all in and go work in a Starbucks somewhere.

After I'd calmed down, Heather was the first person to come up and talk to me. She told me everything was going to be all right, and that most students starting out on their projects felt pretty much the same way.

As trite as it may sound, I credit almost everything I know about beekeeping to Heather's mentor-ship. Every compliment I receive I credit to her, and every criticism I get is someplace that I've failed her."

Rob Currie, a Postdoctoral Fellow in my laboratory and now professor at the University of Manitoba, recalls another example of Heather's calm demeanor during a conference held in San Antonio, Texas: "*We decided to walk to El Mercado to get some Mexican food, and Heather and Margriet were walking ahead engrossed in a conversation. Suddenly a bearded man strode briskly across the roadway, reached into his coat, and withdrew a large hand gun which he cocked. It was a surreal experience, like we were caught in the middle of a movie.*

The man, who at this point was firmly grasping the gun with both hands, excitedly uttered "MOVE!" Seeing no response from Heather or Margriet, he added emphasis as he shouted "Move Lady, Move," while motioning to the side with flips of his gun. Despite his valiant attempts Heather and Margriet still remained fixated in place. Finally, in exasperation, the gunman decided to state the obvious "Lady, THIS is a GUN! Move!"

Heather's feet finally activated as several uniformed police officers came out of nowhere and ran to apprehend their suspect. She had unwittingly become involved in the middle of an undercover drug bust.

A mere mortal would have required extensive therapy after such an event. Heather carried on and finished the

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"She exceeded even her own high standards during the 1999 Apimondia meeting, when 3,000 beekeepers from around the world descended on Vancouver for a week."

walk to El Mercado where we all enjoyed our dinner."

Heather has always seen her job as much more than just running bees and helping students. She has been deeply involved in teaching, at many levels. She visits schools, coordinates school visits by my students, and answers innumerable calls from the public about bees.

Her dedication to public awareness about bees reached a high point during our Once Upon a Bee project that focused on the importance of wild bees in the city. Alice Miro and Désirée Tommasi, the two undergraduate students who ran the project, wrote: "*Heather has been instrumental at enhancing community access to the SFU Bee Lab and its educational facilities. She would spectacularly juggle her research commitments, and always provide us with equipment, graduate student assistance, and up-to-date information to host youth and community members, turning their visits into fun and outstanding learning experiences. Thanks to Heather's impeccable work, we were able to host hundreds of youth from all over Vancouver, as well as participants in a non-credit, barrier free course offered to disadvantaged residents of Vancouver's inner-city communities. Heather's commitment to providing access to scientific knowledge to people of all ages and backgrounds has been a model I will never forget.*"

Heather also organized innumerable field days, a couple of Western Apicultural Society meetings, and a half-dozen or so Bee Masters courses, a week-long program for advanced beekeepers held every second year at SFU.

She exceeded even her own high standards during the 1999 Apimondia meeting, when 3,000 beekeepers from around the world descended on Vancouver for a week. She was in charge of the hundreds of volunteers who made the meeting happen.

Don Dixon, who chaired the Canadian Organizing Committee, wrote that her "*Enthusiasm and support for the Vancouver Apimondia Congress was tremendous – not only in terms of the hard work she put into the Congress but perhaps just as important through the enthusiasm and coordination she brought to bringing together a large number of local volunteers. The amount of work that got done by Heather and the people that she brought, especially in the few days just before and during the Congress, was huge. Her quiet, yet steady leadership with the volunteers worked perfectly and made a very important contribution to the success of the Congress.*"

The stories and praise go on:

"*Heather is the most hardworking, dedicated, helpful, and genuinely caring person I know, and a great role model.*"

"*I was lucky enough to get to work with Heather on an almost daily basis towards the end of my degree, and it was without a doubt some of the most fun I had during my time in Vancouver. She'd exclaim over the new lambs at our field sites one day, and go cruising through campus in her bitchin' Camaro the next.*"

"*Heather is a remarkable lady, and I'm thankful I was able to work with her.*"

"*Graduate students would fight over riding shot-gun during carpooling events. Riding in Heather's Camaro was the pinnacle of graduate student luxury. Knowing Heather's mild nature you might mistake her as the owner of a Sentra, but no, she drives a green Camaro and it suits her even better.*"

If there's ever a Beekeeping Technician Hall of Fame, Heather would be its first inductee, although she would modestly wonder what all the fuss was about.

She has learned, and taught generations of my students, the most important lesson we can glean from our bees: it's all about community, and none of us are successful by ourselves.

Still, every hive has its queen, and Heather is the queen of my lab, wings down. BC

Mark Winston is a Professor at Simon Fraser University, Burnaby, B.C., Canada, who really owes Heather!

Malcolm T Sanford

USDA Bee Lab Review

"Lots goes on in our bee labs."

There was a lot discussion in Reno concerning unusual winter colony loss of bees around the country The situation described by some as catastrophic, with some 50 to 80 percent loss as common, even for beekeepers with decades of experience. This means that fewer bees were available for almond pollination at the very time that growers are expanding their plantings of this valuable nut. The result was a bidding war for pollination contracts by growers desperate to ensure a crop. Prices over $100 a colony and more appeared. Beekeepers around the nation moved their pollinating colonies to the West Coast. In other places, like Florida, the situation was described as a "giant sucking sound," as bees moved from their traditional watermelon and other cucurbit pollination contracts to almonds. Should this trend continue, it is conceivable that a total redesign of commercial pollination map by beekeepers is in the works.

There seems to be no common denominator as to why bee losses are high. Ideas range from pesticide-tolerant *Varroa* to viruses to contaminated comb. In response to a resolution in Reno to ask for more funding for bee research, the Federation has taken the unprecedented step of asking that it be doubled at the federal level. At the Reno meeting, Dr. Kevin Hackett, the USDA's National Program Leader for Bees and Pollination provided an overview of current activities. These include in the aggregate some $8,844,000 split up among several research facilities around the nation and world.

The Beltsville Bee Laboratory has the lion's share of the budget at $2,052,800. Dr Mark Feldlaufer is the research leader and he provided a report on that lab's activities, which are mostly directed at *Varroa* research, but also reproduction and treating diseases like American foulbrood (AFB). The Baton Rouge Laboratory is not far behind, accounting for $1,908,500 with Dr Tom Rinderer as research leader. The activities are mostly involved with bee breeding and stock issues; the Russian bee program and the initiative by Dr. John Harbo in looking at suppressed mite reproduction (SMR). The Weslaco Bee Laboratory has a budget of $1,877,800 and has an acting research leader (Dr W Ivie). There are some vacancies at this lab made more severe with the unfortunate death of Dr Patti Elzen. The lab's mission concentrates on Integrated Pest Management (IPM) for bee diseases and parasites. The Tucson Laboratory with a budget of $1,115,300 and Dr. Gloria DeGrandi-Hoffman as research leader orients its activities to bee health and pollination, including issues surrounding Africanized honey bees.

Less well known are activities at the Logan, UT Laboratory, involved in other types of bees, but also honey bees with emphasis on *Varroa* and chalkbrood with a budget of $1,595,600, research leader is Dr W Kemp. Two other laboratories have some bee involvement, the Fargo, ND Laboratory under direction of Dr G. Yocum ($86,800) with microarray chips, and the Gainesville, FL location administered by Dr. Peter Teal ($207,400). The latter facility has developed a trap for small hive beetle control, which was demonstrated at the convention and is under consideration by several manufacturers. Two other facilities are also involved in bee research, although there are no funds dedicated to this activity in the budget described by Dr Hackett. The Kearneysville, WV location is leading the way with sugar esters for *Varroa* control and the Montpellier, France Laboratory is involved in modeling hive environmental conditions.

Some recent accomplishments reported in Reno by Dr. Hackett include:

"At Baton Rouge, Dr. Rinderer's group found that Russian Bee resistance to *Varroa* is enhanced in apiaries having only Russian colonies. The susceptible stock apparently serves as a source of infestation for the entire apiary. Also, Dr. Harbo's group found that there is no relationship between the SMR trait and poor brood production – this means it should be possible to produce a hybrid bee with good beekeeping qualities that is free of *Varroa* mites.

"At Beltsville, Dr Chen's lab has found that *Varroa* mites transit bee viruses – this potentially implicates the mite in virus-caused hive decline. The transmitted virus was "deformed wing virus" – one never before detected in the U.S. And Dr Collins group found that bee queens inseminated with low viability semen function as well as normally inseminated queens, at least for one summer season.

"At Tucson, Dr DeGrandi-Hoffman's group has developed a liquid pollen supplement for spring buildup – needed, particularly, for almond pollination. The group has also found a natural bee pheromone that acts as a toxicant to mites – it's being developed into a product.

"We have also made progress at two other ARS labs that did not traditionally have program in bees. At Gainesville, you have already heard Peter Teal describe his small hive beetle trap. This is an example of how we can take advantage of the ARS distributed network of labs and expertise. Peter's lab works with attractants, and he has made quite a find with this trap.

"At Kearneysville, Drs. Puterka and Glenn have been able to apply a technology that was developed to control aphids – using it for control of *Varroa* mite. Their "sugar ester

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product" is now being marketed. Since many of you might have tried the product, I'd like your feedback on whether it has been useful."

The ABF is seeking enough new research funding to employ 16 new scientists, including two geneticists, two molecular biologists, and two computational biologists. Unfortunately, the Bush Administration has called instead for cutting $640,000 Congress has been providing to the Weslaco and Baton Rouge Laboratories.

Any increase in the Federal budget will be a hard sell, but there has never been so much awareness of bee loss and recognition by growers that pollination is important. This represents another "teachable moment," for those involved in beekeeping. The ABF recommends pulling out all the stops, and having not only individuals, but also associations contact legislators via regular and electronic mail. The newsletter provides a sample letter and various background information prepackaged for sending to lawmakers. Finding relevant legislators has never been easier, call the Congressional Switchboard 202-224-3121 and ask for senators and representatives who "handle farming issues," or use the World Wide Web and going to <http://www.senate.gov> and <http://www.house.gov>. BC

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

PESTICIDE LABELS
Do They Protect Bees?

James C. Bach

Beekeepers have been experiencing bee losses from pesticides since the 1870s when Paris Green was used to control codling moth in apples. In 1881 Mr. GM Thompson identified Paris Green applied to pear bloom as damaging honey bee colonies. In my early years as State Apiarist for the Washington State Department of Agriculture (WSDA) I recall mostly the complaints of beekeepers about their losses from pesticides. The "big one" of course was Penncap-M, a microencapsulated formulation of methyl parathion. It was especially devastating because the bees brought the capsules back to the hive and stored them with the pollen.

In the last 15 years beekeepers have turned more from complaining to taking a serious look at how pesticide labels are written and how they could be changed to better protect honey bees and wild bees. Many people from around the country have participated in this effort and made attempts to change label language. Gradually, sometimes with much anxiety and even resistance from manufacturers and users, EPA has made strides in creating label language that does better protect bees a) IF the user reads the label, b) IF the user follows the label, and c) IF the user heeds the advisory statements on the label. If a ground or aerial applicator does not choose to do all three, bees will not be fully protected.

But more work remains to be done. For at least the last 10 years the EPA has been trying to further modify bee protection statements. I was invited to join their tele-conference committee about five years ago to address the issue that pesticide residues were killing bees because users were ignoring that text on the labels. In our discussion I specifically asked EPA if their Congressional mandate was to protect native pollinators and managed honey bees or just honey bees. The representative stated that the mandate was to protect "bees," including both native and managed species. That answer changed the tenor of the discussions since many had apparently never considered that broad mandate, historically having only considered managed honey bee colonies. Native species did not have a human voice and so had been denied consideration and representation in the label-crafting process. Due to conflicting positions of committee members and public testimony, EPA's effort to address the residue issue currently remains in "limbo."

In late 2004 I sent a survey to the State Apiarists across the U.S. that had active apiary programs, seeking information about which agricultural pesticides had been reported as killing bees. Seventeen (17) states responded to the survey. Twelve (12) states identified 20 insecticides that killed bees and one fungicide that killed brood. Three (3) states reported no pesticides. One state said that home remedies for the control of *Varroa* and Small Hive Beetle were killing bees. And one state said a beekeeper used DDT in his own hives and killed bees. The 20 insecticides mentioned by the states leave active residue ranging from two days up to more than a week.

I reviewed the labels of the 21products and found that they have six somewhat different 'bee protection statements.' They may be combined to read as follows:

> "This product is ("toxic" or) highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product (or "pesticide") or allow it to drift to blooming crops or weeds if bees are actively visiting (or "foraging in") the treatment area."

This text is considered by EPA to contain "advisory" and "enforceable" language. Label sentences that begin with: "Do not" or contain

phrases like "you must," or "you shall," are enforceable. The intent is *not* that they modify their use according to the advisory language, though it may be hoped that they will do so. The intent is: Do not apply this pesticide or allow it to drift to blooming crops or weeds if bees are actively foraging in the treatment area." All other sentences are considered advisory, meaning that the user is *encouraged* or *intended* to take them into consideration when choosing or using the product.

If the user makes an application, or a pesticide drifts onto blooms when bees are *not* present, as in a late evening to early morning application, the user is in compliance with the label even if heavy bee losses occur for several days from contact with the active residues. The *advisory* language about applications or drift that exposes bees to residues is not enforceable. So that language does not protect any bee species from pesticide applications that leave active residues.

Further there has been discussion about the use of "visiting" and "foraging" and what they mean. Bee behavior indicates that they will not "visit" unless they are "foraging" so both words mean the same, though I prefer the use of foraging.

Several people asked EPA how they define "the treatment area." EPA responded that it is the intended target area of the applicator (*excluding* the drift area). In my public testimony to EPA I suggested that the "target area" is the crop specified on the label, but the "treatment area" is that area *including* the target crop, blooming weeds and other sites that receive the application due to direct application and/or drift caused by wind, air movement or miscalculation by the applicator

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Jim Bach was the Apiary Inspector for Washington, then became a Pesticide Compliance Investigator.

SPRAYERS LIABLE. BEEKEEPERS WIN!

On March 3, 2005, the Minnesota Supreme Court ruled in favor of beekeepers Jeff Anderson, Steve Ellis and Jim Whitlock, holding that nearby landowners who sprayed pesticides on their hybrid poplar groves could be held liable for damages to the beekeepers' neighboring apiaries. At issue was the landowners' use of **Sevin XLR** Plus, a carbaryl-based product that acts like nerve gas in destroying insects. Although the product was used to control cottonwood leaf beetles on the poplar groves, it had the same deadly effect on honey bees and other beneficial insects, that forage within the treated areas.

In their lawsuit, the beekeepers, represented by attorneys Stephen Rufer and Tim Rundquist of Fergus Falls, MN and Gary Van Cleve of Minneapolis, MN, alleged that the landowners, the State of Minnesota and International Paper, used Sevin on their plantings with actual or constructive knowledge that beekeeping operations were within forage range. The beekeepers have asserted that they suffered annual stock losses of thirty to fifty percent, and that the landowners did their spraying with full awareness of such a result.

The Minnesota District Court initially disposed of the lawsuit on summary judgment, holding that not only did the landowners have no legal obligation to the beekeepers, but also that the opinion testimony of a Minnesota Department of Agriculture official, submitted after commencement of the action, was entitled to deference as to his interpretation of the Sevin label. The application directions on the label must be followed to the letter, as a matter of state and federal law, and the beekeepers had charged that numerous violations had occurred. Nonetheless, the official opined that label directions, according to his interpretation, had been properly followed, and the court held that this interpretation should control above all others.

The Minnesota Court of Appeals agreed with the district court, affirming its disposal of the case. However, in October 2004, the Minnesota Supreme Court heard the case, and in the March decision reversed all prior rulings.

First, the Court held that "a land possessor with actual knowledge or notice of foraging honey bees on the property comes under a duty of reasonable care in the application of pesticides." No other case nationwide had ever recognized a common-law duty specifically protecting bees; prior opinions had held that foraging bees should be regarded as "trespassers," and that a landowner therefore could use his land as he saw fit without any obligations to the bees.

Second, the Court determined that the "state agency expert's interpretation of the pesticide label was not entitled to judicial deference." In so ruling, the Court pointed out that the expert's opinion had been prepared in anticipation of the litigation at issue rather than as a matter of agency policy; thus, the state's expert should be entitled to no more deference than those proffered by the beekeepers, who had very different opinions as to proper interpretation of the Sevin label. In recognizing viable causes of action for the beekeepers, the Court remanded the case back to the District Court for further proceedings.

More About Pesticides on Next Page

ENFORCING LABELS

How Some States Do It

How do state agencies and EPA cooperators enforce so-called 'bee protection statements' in pesticide labels when bee kills are reported by beekeepers? The answer depends on the training and expertise of the investigator. In Washington State I conduct the following activities:

1. The investigator interviews the complainant beekeeper to gather all the known facts including the date and time of the alleged incident, review any field notes kept by the beekeeper of previous visits to the apiary(s), request information about previous management practices including feeding and movement of the apiary. An estimate of the probable cost impact is also requested from the beekeeper. Washington State statute precludes the department from pursuing an investigation if the beekeeper doesn't produce a cost impact estimate. The investigator questions the complainant about Tracheal and *Varroa* mite count in the colonies, and the mite and disease treatment strategies used by the beekeeper for the past several years. Other information that the investigator solicits includes timing of colony management activities like requeening, splitting the colonies, establishing nuclei and feeding pollen, syrup or sugar.

2. The investigator visits the apiary(s) to determine the extent of the alleged pesticide loss. He/she opens five to 10 percent of the hives in an apiary that are randomly selected. Their observations include the number and location of dead bees at the hive entrance, dead bees on the bottom board, size, orientation and location of the remaining bee cluster, queen presence or absence, any break in the brood cycle, bee behavior towards the queen, the amount of open and sealed brood and its relation to the size of the colony, location of nectar storage in the brood nest and any supers on the hive, syrup feeding, and the amount of pollen stores in the hive. This visit to the apiary includes photographing the location, surrounding blooming crops and weeds in the area, the hives in the apiary, the extent of the bee loss, which includes the bee cluster size.

3. The investigator next visits the alleged infractor (grower, applicator) if one is known or suspected. He solicits information about any pesticides the applicator has used and the timing of the application. He usually issues a formal Record Request immediately or through the mail specifying the time frame of records sought to correlate with the estimated time of the alleged bee loss. Application records must include 11 data elements that accurately describe the spraying activity. The applicator must complete the record for each application on the date of the application and keep the records for *seven* years.

4. If the same or other blooming crops and or weeds are in the area surrounding the damaged apiary(s), the investigator will interview the growers or applicators operating in the area to gather further testimony that might bear on the investigation. Usually a visit is made to growers of blooming crops in a two mile radius of the damaged apiary, since that is the optimum foraging distance of bees in a diversified agricultural area. Some bees will forage up to three to four miles but they won't travel any further than is necessary to bring home the groceries. Record Requests will be issued to any growers or applicators operating in the vicinity of the damaged apiary.

5. Submitted records are reviewed for compliance with state statutes regulations, and to determine that all data has been collected.

6. The labels of the pesticides shown in the submitted records are reviewed to determine whether the application was made in compliance with DO NOT statements included on the labels. The whole label is reviewed because there are usually several enforceable statements scattered throughout the label. If the language appears obtuse it may be necessary to get a formal opinion from a state pesticide registrar or EPA to properly interpret label requirements.

7. While in the apiary the investigator takes samples of fresh dead bees randomly from in front of several hives, and possibly from within the hives. If contamination of the pollen stores is suspected (as with Penncap-M) a comb of fresh pollen may be taken for laboratory

analysis. The investigator maintains a *documented chain of custody* of the sample(s) to freezer or refrigerator storage or to the analytical laboratory.

8. Once the most likely pesticides used are determined from the investigation and application records, the samples of bee and comb are tested by the laboratory. With today's techniques a 'screen' may be run to find several pesticides within a class, or individual tests may be done for specific pesticides used on the crop at the time of year identified in the investigation.

If pesticide residues are found in the dead bee sample(s) the results are documented in the investigation report. If only one pesticide application is the likely cause of the bee loss the alleged infractor may be easily identified. If the bee loss is complicated by more than one pesticide application, by beekeeper negligence, mite damage, or a pesticide applied by the beekeeper, a final determination of the responsible or most responsible party may be difficult or impossible.

9. When an applicators' records contain one or two minor violations, the investigator may issue an Advisory Letter to the infractor explaining the violations and requiring specific remedies to achieve compliance with statute and regulation.

10. When several record keeping and or *any* label violations are found, the investigator will issue a Notice of Correction (NOC) to the infractor for a first offense. The NOC may sometimes be modified by negotiation if new information or extenuating circumstances are found after the investigation is complete. The NOC is not subject to appeal and is a public record, should copies be requested by interested parties under the state's Freedom of Information Act. The NOC identifies each element of the record keeping or application that is out of compliance and gives specific instructions to the applicator to achieve compliance with statute, regulation and the label.

11. A Notice of Intent (NOI) to suspend a license and issue a civil penalty is issued to an alleged infractor if they are found to be out of compliance in a second or third similar violation. The NOI prescribes a number of days of license suspension and a monetary penalty relevant to the gravity of the non-compliance and economic impact of the violations. In Washington the license suspension may be from several days up to a permanent suspension, and the monetary penalty ranged between $250 and $7,500, both of which are negotiable. The NOI is subject to appeal to an administrative law judge and or the Director of the department.

12. During my investigations I discussed cases with my supervisor to gain the advantage of his pesticide use and regulatory experience. When I have completed the case I give the file to my supervisor for final review of all the data, the case report, the pesticide labels and any physical evidence. He may make even further suggestions that might improve the investigation and or report. Following his signature to the case, an Investigation Report is sent to the complainant (beekeeper) and the alleged infractor (applicator). If the case involved human exposure to a pesticide, a copy is also sent to the Department of Health to substantiate their findings.

Since we are under contract with EPA to enforce the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), under the authority of which pesticide label requirements are issued and pesticide applicators are licensed, our investigations are subject to *their* review.

When there was an Apiary Program in Washington I would help the beekeeper calculate the economic impact of the bee loss including the:

- Costs of replacing the dead bees by purchasing packages or replacement colonies,
- Mitigation of the loss by investing in feeding pollen and syrup, requeening the colony and the necessary travel and labor costs,
- Loss of pollination and honey production income based upon recorded costs and income for undamaged apiaries and historic data,
- Potential for the continuing bee loss over time, and
- The likely impact to the surviving queen and colony over the next two to 10 months.

The complainant may use the investigator's case report to support their claim against the infractor's insurance company. Eventually, I may be called upon to give a deposition in support of my investigation, or to appear in court if litigation is involved.

WHAT DOES IT SAY?

I reviewed the labels of several products and found that they have six somewhat different 'bee protection statements' as follows:

• **Malathion and Imidan 70-W** – leaves residues for several days:
"This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are actively visiting the treatment area."

• **Methyl Parathion, Diazinon, Furadan, Lorsban, Guthion, Asana XL, Dimethoate** – leaves residues from two to seven days:
"This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area."

• **Penncap-M** – leaves residues for seven days:
"PENNCAP-M IS HAZARDOUS TO BEES exposed to direct treatment or residues on blooming crops and/or blooming weeds. Do not apply PENNCAP-M or allow it to drift to blooming crops and/or blooming weeds if bees are foraging the areas to be treated.
Refer to and follow the more specific and applicable precautions in the directions for certain crops. Information for protecting bees may be obtained from Cerexagri at 1-800-797-5338 or your local Extension Service."

• **SpinTor 2SC, Success** – leaves residue for two days:
"This product is toxic to bees exposed to treatment for three hours following treatment. Do not apply this pesticide to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period.
The three hour limitation does not apply if the applicator operates in a state with a formal, state-approved bee protection program, and the applicator follows all applicable requirements of the state-approved program designed to ensure that managed bees are not present in the treatment area during this time period."

• **Sevin, Carbaryl** – leaves residue for up to seven days:
"**BEE CAUTION: MAY KILL HONEYBEES IN SUBSTANTIAL NUMBERS.** This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting (or foraging) in the treatment area. Contact your Cooperative Agricultural Extension Service or local Bayer CropScience representative for further information."

• **Sevin XLR Plus** – leaves residue for two to three days:
"This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. However, field studies have shown that SEVIN brand XLR Plus Carbaryl Insecticide is less hazardous to honey bees than other carbaryl products when direct application to bees is avoided and the spray residues have dried.
For maximum honey bee hazard reduction, apply from late evening to early morning or when bees are not foraging. Do not apply this product or allow it to drift to blooming crops or weeds if bees are foraging in the treatment area. However, applications may be made during foraging periods if the beekeeper takes one of the following precautionary measures.
Prior to bee flight activity on the day of treatment, (1) Confine the honey bees to the hive by covering the colony or screening the entrance or; (2) locate hives beyond bee flight range from the treated area. Precautionary measures may be discontinued after spray residues have dried. Contact Cooperative Agricultural Extension or Bayer CropScience for further information."

BEE BREEDING IN IRELAND

Micheál Mac Giolla Coda

The Galtee Bee Breeding Group (GBBG) was formed in 1991 with the object of conservation, study and improvement of the native strains of Dark European Honey bee in the Galtee/Vee Valley and surrounding area of South Tipperary, Ireland. In the first year we had only four members and our membership increased gradually during the early years.

After the Bee Improvement and Bee Breeding Association Conference in our area in 1996 we decided to invite some more prominent and active Irish beekeepers to join us and we have continued this policy up to the present. We now have about 60 members mostly in the provinces of Munster and Leinster and this year we have been joined by two members from Ulster In all about 20 Beekeepers' Associations are represented among our members. We enjoy the full support and co-operation of the two main beekeeping umbrella organisations in Ireland i.e. the Federation of Irish Beekeepers' Associations in the Republic of Ireland and the Ulster Beekeepers Association in Northern Ireland.

Micheál Mac Giolla Coda and the Editor, judging honey at the National Honey Show in London.

The Galtee/Vee Valley is about 20 x 8 miles and is situated between the mountain ranges of the Galtees and the Knockmealdowns. Midway in the centre of this valley we have established our breeding apiary and this is still the centre of our activities. A policy of displacement breeding has been adopted from the start and this we call our Dun Aonghusa system. The elimination of hybrids and other undesirable characteristics such as over aggressiveness and excessive swarming was our primary objective.

We have made extensive use of morphometry to identify hybrids especially in the early stages. We are extremely lucky to have as a member of our group the eminent scientist Dr Jacob Kahn who is currently engaged in ongoing studies into the morphometric characters of our native Irish bees.

GBBG has devised a programme of evaluation, recording, culling, and selection that has proved very effective over the years. Each year selected breeder queens are brought back to the breeding apiary. These are used for the production of queens and drones in the following year We use instrumental insemination to produce various combinations from selected queens and drones each year and these are distributed to group members who keep records for testing and evaluation. Group members are entitled to two breeder queens from our breeding apiary each year at a nominal price. We encourage all members to keep records and submit summary returns to one of our members at the end of each year. This information is being used to establish and update our group stud book.

An offshoot of our activities is the fact that a number of smaller bee improvement groups are in the process of being established in other places throughout the country and we hope that this trend will continue.

The Department of Agriculture in the Republic of Ireland has co-operated with us so far by maintaining a ban on the importation of bees and queens. Unfortunately the Northern Ireland Ministry of Agriculture has seen fit in recent years to allow the importation of queen bees under licence. These queens are imported from different parts of the world and are of a variety of races. If this trend continues it can have a deleterious effect on the purity of our native bee which is the race that predominates throughout the island of Ireland.

We have a cool, damp, oceanic climate, and we believe that the native Irish strains of Dark European Bee are by far the most suitable for our climate. Unfortunately no effort was made to improve our bees until the formation of GBBG fifteen years ago. Even in that comparatively short time our simple breeding policy has resulted in improvements beyond our wildest dreams. We have identified docile strains that can be manipulated with the minimum of protective clothing and even in shorts and tee shirt in fine weather

Our next major objective is the reduction in swarming which is an important economic factor in beekeeping. We had a significant breakthrough at the end of the current season when we identified a number of colonies that had come through the past two swarmy seasons without attempting to swarm. The ancestors of these queens had been selected for the combined traits of supercedure, longevity, docility and productivity.

GBBG holds a variety of activities throughout the year such as outdoor demonstrations on colony evaluation and recording, queen rearing workshops, and a winter discussion and study group. There is an Annual General Meeting and we produce a quarterly newsletter known as "The Four Seasons – Ceithre Ráithe na Bliana"

There will be special workshops on the Native Dark European Honeybee at Apimondia Ireland 2005. For further information, see www.apimondia2005.com. BC

Micheál Mac Giolla Coda, is the Chairman of the Galtee Bee Breeding Group, Email: galteehoneyfarm@hotmail.com; Galtee Bee Breeding Group: www.gbbg.net

IBRA
INTERNATIONAL BEE RESEARCH ASSOCIATION

BUZZ EXTRA

No. 2 May 2005 THE WORLD VIEW OF BEES AND BEEKEEPING

APIMONDIA CONGRESS

The Apimondia congress is the main highlight of the international beekeeping calendar. Beekeepers, scientists, pollinators, packers, equipment manufacturers, apitherapists, entomologists, academics, farmers and growers from all over the world come to participate in the congress and the accompanying exhibition.

The beginnings of the event go back a long way to when the first International Beekeeping Congress was held in Brussels, Belgium, in 1897. Twelve congresses in all were held up to the Zurich Congress in August 1939. By that time a pattern was emerging where the meetings took place every two years. World War II disrupted the sequence and it was not until 1949 that the Congress re-established itself and about this time took on the name by which it is best known today – **Apimondia.**

The 1949 Congress in Amsterdam was an important international meeting after the disruption brought about by the war. Indeed then, and perhaps even more so now, Apimondia proves that there are no frontiers in beekeeping and it is always a privilege and a pleasure to attend.

The1949 Congress was also an important one for IBRA for it was there that Dr Eva Crane had her first open opportunity to give her vision for the Bee Research Association then just 8 months old. Although there was no "international" in the title until 1976 it was obvious from the very beginning that the vision was for a trans-national organization – an organization without frontiers. Modestly, in her report in **Bee World** (November 1949) Dr Crane reports that she described the aims and work of the Association and its role "in helping amateurs carrying out research work and in making the results of research more widely available". It is interesting to note that at that time **Bee World** was adopted as the official organ of the working party of the Congress.

That was the XIIIth Congress. Since then it has grown and gyrated around the world a couple of times. This year it will be bigger and better than ever when the XXXIXth Congress will be held in Dublin, Ireland, from 21st to the 26th August. The Irish contingent have been voluble and highly visible at the last three Apimondias - Vancouver (1999), Durban (2001) and Ljubljana (2003). At these conferences we have had wonderful Irish Nights and I am assured there will be a whole week like that in Dublin! If you have not been to Apimondia you have missed a rich beekeeping experience – don't miss this one. Last time there were representatives of about 80 nations present thus providing a wonderful opportunity to meet up with old friends and to make new ones. The Apiexpo had around 100 stands offering insights, innovations and information on all aspects of beekeeping.

Such an international gathering brings a spotlight on the host country and many national governments choose to mark the event by issuing special postage stamps or coins. The event itself always has an official commemorative badge and there are examples in the IBRA Historical Collection. A very small selection is shown here and they pose the question: "What will Ireland will come up with?"

Leamington Spa, Great Britain, 1951 ▶

◀ *Copenhagen, Denmark, 1954*

Madrid, Spain, 1961 ▶

◀ *Warsaw, Poland, 1987*

Dublin, Ireland 2005 ▶

EDITORIAL

"Brown paper packages tied up with string
These are a few of my favourite things"

A quotation that takes us back some 40 years. Therefore, I shall not assume that the song will spring readily to the lips of all our readers. It comes from "The Sound of Music" and at present it could be the theme tune here at IBRA.

Few of you will have missed the references frequently made in Buzz Extra to the Historical Collection of Artefacts more compactly summed up as the IBRA Museum. Ever since the Association moved, in 1985, from Buckinghamshire to Cardiff a large volume of our offices has been taken up by brown paper packages – well brown cardboard boxes really. Meticulously wrapped and stored in these boxes are literally hundreds of items related to beekeeping and the wider aspects of apiculture. Why after almost 20 years in storage should they cause some excitement?

Many of the items are catalogued in hand written records, a large number have been carefully set aside awaiting such attention; that time has now come. We are in the process of committing all the old records to an electronic database. Where necessary new records have been created and over 1200 individual items have already been entered into the computer. This involves far more than inputting written data: so far over 1900 scans of illustrative material have been made, almost 600 35mm slides have been digitised, many other new digital photographs have been taken and the task is nowhere near over yet. The material is then brought together so that each item is covered in as much detail as possible.
The finished product could be the mouth-watering prospect of a series of CD-ROMs making a virtual international museum into reality before your very eyes. I hope the contents of those brown paper packages will become some of your favourite things and that I can count on your support in this endeavour.

Richard Jones, Director.

Bees in the Vatican

Part of a sculpture in the Vatican showing three Barberini bees.

The news in the months of March and early April has been dominated by events in Rome. It may not be widely realised but the city is a place where bees abound particularly in St. Peter's Basilica where, of course, they have a papal symbolism although this came about almost by chance.

It was 120 years from commencement to consecration of the Basilica in 1626. At that time the Pope was Urban VIII - Maffeo Barberini – whose family arms consisted of three bees. He brought these bees to the papal coat of arms and they were then literally built into St Peter's.

They have settled on Urban VIII's tomb at the side of the high altar, on the elaborate bronze baldacchino that stands above St Peter's tomb, as well as on the altar itself. This canopy, under which Pope John Paul II recently lay in state, was made by the artist Bernini for Pope Urban in 1633. On the baldacchino there seem to be bees everywhere – foraging on the plants that climb up the twisted pillars, flying against the roof and in formal triple array on the pelmet that surrounds it. In the Vatican museum the Barberini bees decorate maps, tapestries and many other treasures, as well as the structure itself.

Taken form ***The Archaeology of Beekeeping*** by Dr Eva Crane first published in 1983.

New in the Garden

Can there be anything more soothing than the gentle hum of bees in a sun dappled garden on a lazy summer afternoon? Few would disagree; but sometimes those ideal conditions need a little encouragement. The sunshine may be beyond our control but by offering a home to solitary bees we can go some way to achieving that hum of contentment. Not only do we get pleasing sound effects but also hard working pollinators that increase seed set and crop yield.

There are a number of nest boxes on the market which not only encourage the presence of bees but enhance the attractiveness of any garden. The one illustrated is available from the IBRA shop. It looks pretty and is educationally practical in that, for observation purposes, it is possible to open the nest and marvel at the way in which the bees have prepared for the next generation. This is another opportunity to do your bit for conservation and have the pay back of an interesting and developing project to observe. The nest box costs £25.00 plus postage.

A luxury home for solitary bees. ▶

Bees, Pollination and History

From the days of Antiquity farmers and fruit growers have been aware of the need for pollination even if they did not know or understand the process involved. One of the earliest references to it is the Herodotus (c. 485 – 425 BC) description of hand pollination in Babylon.

The observant soon noticed that when visiting wild flowers bees kept to one plant species during a foraging trip. However, the same observers mistakenly believed the yellow pellets in the bee's corbicula (pollen baskets) on the hind legs to be wax and failed to recognise it as pollen.

Flowering plants (agiosperms) and their pollinators evolved during the same period. Thus, until very recently in the evolutionary time-scale, pollinating insects were present in sufficient numbers to pollinate the crops that interested or were specifically cultivated by mankind. There was no particular need to pay special attention to the plant processes of involved in crop production.

By the late 1800's agriculture was developing towards today's familiar pattern with large areas devoted to single crops and the landscape fashioned to aid the use of machinery and mass production. Yields from some crops began to be unsatisfactory and it could often be shown that this was due to insufficient insect pollination. Also, for example, some varieties of fruit were self-sterile and required transference of pollen by willing carriers from a compatible plant nearby.

In 1676 Nehemiah Grew, and English botanist, described the pollination process recognising the stamen as the male and stigma as the female parts of the plant and the necessity of pollen transfer from one to the other. However, it was Arthur Dobbs in Ireland who first describe clearly the role of honey bees in plant reproduction. Another who stressed the significance of bees and additionally the significance of cross-pollination was Christian Konrad Sprengel. In his book ***Das entdeckte Geheimniss der Natur*** – The discovered secret of nature Sprengel recognised, as did Darwin almost one hundred years later in 1862, that the seed from cross-fertilized plants gave rise to superior offspring.

The first positive provision of bees to ensure crop pollination was in 1885 in New Zealand and the crop was red clover (*Trifolium pratense*). The flowers of this crop have long corollas and in England bumble bees effect its pollination. Therefore, many mated queens of several species of bumble bee were introduced to the country. They soon established colonies and multiplied. The pollination problem was solved but now, 120 years later, attitudes may be different to such a cavalier introduction of exotic species.

Using bees for pollination or for honey production requires different management techniques from the beekeeper. For honey the beekeeper wants to ensure that there is a large population of foraging bees with the priority of collecting nectar: whereas for pollination the bees should be intent on collecting pollen. This can be achieved if the colonies have much unsealed brood at the same time as the crop requiring pollination is in flower. The nurse bees feeding the larvae consume much pollen and stimulate the foragers to go out and collect more. Contract pollination can be more profitable for beekeepers than honey production.

Bees of different species pollinate different plants and some bees are especially adapted to specific plant species by body size and shape or by behaviour. There is great interest and scope for rearing some of these bees as profitable pollinators. Much is being done in this field and such work is regularly reported in the journals of the International Bee Research Association.

More details are available at: www.ibra.org.uk or from IBRA at 18 North Road, Cardiff, CF10 3DT, Wales, UK

These illustrations are from original watercolours by Dorothy Hodges, author of

THE POLLEN LOADS OF THE HONEYBEE

a seminal work published by IBRA in 1952

Honeybee foraging for nectar and pollen

Detail of a foraging bee still packing willow pollen into the pollen baskets on her hind legs.

Small Hive Beetle A Review

The small hive beetle (SHB) left its native land in Africa and quietly arrived on our shores. (Yes, there is a large hive beetle in sub-Saharan Africa – we don't want this one either.) Here in the U.S. the SHB found an ideal environment in the humid southeast. Unfortunately this beetle was a totally unfamiliar pest here in the U.S. so everyone was scrambling trying to find out how it lives and how to eliminate it. Like so many imported pests, elimination is not an option.

The beetle is small, easily overlooked in package bees and indeed in hives full of bees. But it quickly makes its presence known with the destruction of the honey crop. The SHB can certainly fly but our honey bees that are traveling for pollination or are in packages sent throughout the country accept the hitchhikers and become the main means of transportation. Many beekeepers have heard about it and some have had first-hand experience. The initial horror stories from beekeepers in Florida managed to strike terror in the minds of beekeepers across the country.

In Florida there is a large population of commercial beekeepers, both pollinators and honey producers. When the SHB first arrived the pictures of thousands of squirming larvae and reports of fermented honey running from the hives set many people scrambling for answers. Few answers were available. Once the beetle was identified along with its native land it seemed that help was at hand. However the information from South Africa was limited since the beetle is not considered a problem there. One reason is that the bees in the beetle's native land are different – *Apis mellifera scutellata* – the African bee, and *A. m. capensis* – the Cape bee. Another reason is that beekeepers have learned to cope with the beetle.

Today in Florida the beetle is still a problem but some beekeepers, particularly commercial ones, have learned how to cope. According to David Westervelt, Research Specialist for the Florida State Apiary Inspection Service, the commercial honey producers are now keeping very clean honey houses. Filled honey supers are either extracted immediately or put into cold storage until time to extract. Those beekeepers who are not following this program are still having difficulty with SHB in the honey house.

The problem of SHB is most severe in the coastal part of the state. In central Florida where most of the beekeepers and honey houses are located, the efforts of control seem to be somewhat effective. One problem, still to be overcome, is the great infestation occurring from splits being made or from over-inspection of the colony. Any stress on a colony leads to severe problems. Westervelt is seeing losses of 20 to 30% when splitting colonies. The beetle is attracted to the bee's stress pheromones and, of course, the colonies from which splits were taken and the splits themselves are small, vulnerable colonies. SHB can easily take over weak or small colonies. Westervelt has also reported that the grease patties used for tracheal mite control are attracted to SHB.

Beekeepers have found that the ground drench used for larvae control is highly variable. Many hobbyists use it with some success. They also use the corrugated plastic with the Checkmite+ strip in the bottom of the hive as a beetle trap and it works well. The West SHB trap sold by Dadant & Sons, Inc., is very effective. However that trap, as designed, contains a reservoir of oil – liquid – that can easily spill. Furthermore the hive must be level

A heavy infestation of Small Hive Beetle larvae. (Cutts photo)

Continued on Next Page

Small Hive Beetle larvae have firmer bodies than wax moth, and spiny legs. (ODA Photo)

side to side and front to back. Admittedly this can be difficult in many beeyards. Therefore some beekeepers have substituted some dry powders, harmless, but effective.

Unfortunately in Florida, as in other states, there are beekeepers who do not belong to any bee association, do not read the bee journals and have little contact with other beekeepers. Florida has not had the funds for pamphlets or other informational means for reaching such beekeepers. These are the ones with the biggest problems. Some may have stopped beekeeping and some may well do so in the future.

Westervelt's advice to beekeepers is to keep strong, healthy colonies, with as little disturbance as possible and keep a clean honey house. Actually that advice applies to all beekeepers, with or without the SHB.

Next, we're heading north to Georgia, which is geographically quite different from Florida. Dr. James Ellis, of the University of Georgia, traveled to South Africa to conduct his research on the SHB. In South Africa research is focused on the beetle itself, not on its control. Ellis reports that the beetle is a big problem in southern Georgia, as well as Florida, southern Alabama and coastal South Carolina. The beetle does not seem to be a problem in northern Georgia, actually above the fall line (a line across the state, approximately from Columbus to Augusta). In southern Georgia beekeepers report losses; above that line beekeepers are not too concerned. This does not mean that the beetle is not present; it only means that the SHB has little or no effect. That does not stop beekeepers from panic when they see a few beetles and begin treatments that may be unnecessary since the SHB may be only a nuisance. Dr. Ellis feels that stress is a big factor in SHB problems. Weak colonies, mites, diseases, queenless colonies are definitely at risk of being invaded and destroyed by the SHB.

Research is ongoing, not only here in the U.S. but also in Australia where the beetle arrived several years ago. In Georgia, Dr Ellis is continuing his research in several different directions. He feels that the future of SHB control is in using non-chemical means, such as lures, traps and forms of biocontrol. Unfortunately not all beekeepers are interested in anything except an immediate chemical end to SHB.

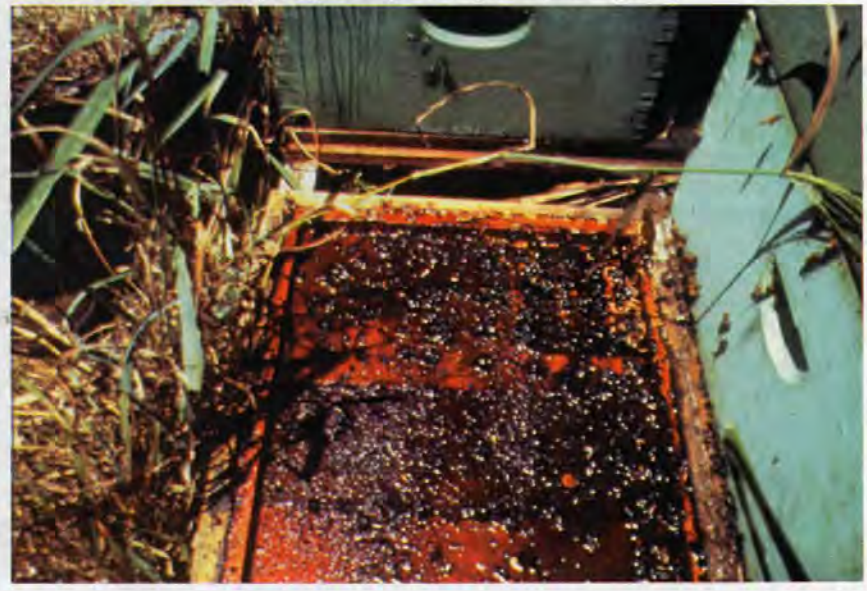
Ellis is working with Dr Mike Hood, South Carolina, and Dr Keith Delaplane, Georgia, on testing various traps. In addition they are working on determining an economic threshold, especially connected to *Varroa*, to determine appropriate treatment. Ellis is also investigating honey bee hygienic behavior and biological control with nematodes and fungi.

His thoughts on the possible spread of the beetle are interesting. He noted that the native home of SHB in much of Africa is quite arid, much like parts of our Southwest. Does that mean SHB will spread into that area? Although he does not anticipate a problem in that area, he finds the beetle quite unpredictable and full of surprises.

Next, to South Carolina where the first SHB was captured about 10 years ago. Dr Mike Hood describes this state as having mostly hobbyist beekeepers, some of whom have given up beekeeping with the one-two punch of *Varroa* and SHB. Mainly they are the ones who do not belong to associations or read the beekeeping journals and have little contact with other beekeepers. In areas where the SHB is a problem and beekeepers are not performing some measures of control that area becomes a source of infestation for other nearby beekeepers. The SHB can fly, certainly several miles, and are attracted to the odors of bees, pollen and honey.

Coastal South Carolina, where conditions are favorable has the highest infestation of SHB. In other areas beetles are present but beekeepers are not reporting a problem and do not find it necessary for control. Beekeepers who are using Checkmite/plastic traps, and Gardstar report varying results. Hob-

Fermenting honey, oozing out of the hive, was one of the nightmare images beekeepers got early in the game. (Cutts photo)



byist beekeepers tend to remove honey and extract immediately so honey house problems are not a source of reproduction of the beetle. Hood has reported that oversupering in anticipation of the nectar flow can create a beetle problem. Too much space that cannot be defended gives the SHB an opportunity to invade and reproduce.

At present Hood, Ellis and Delaplane are working hard to develop treatment thresholds along with how the combination of *Varroa* and SHB affect a colony. Hood is also working on a trap that will be both effective and simple to use. The efforts at developing non-chemical controls is to be commended. For an excellent and detailed overview of the small hive beetle, you may wish to read "The small hive beetle, *Aethina tumida:* a review" by Michael Hood in the September 2004 issue of *Bee World.*

Delaware is a state on the migratory path of pollinators traveling up the East Coast. Unfortunately it is a state where conditions are favorable for the SHB. Dr Dewey Caron reports that the SHB is surviving and reproducing. But the pollinators move on leaving the local hobbyists to cope with the beetle.

The hobbyist beekeepers have found it difficult for raising and introducing queens. Such an activity necessarily involves manipulation of colonies as well as keeping small colonies – nucs – both of which lead to SHB invasion. The hobbyist beekeepers are being encouraged to prevent weak colonies from being SHB generators, leading to greater infestations in the area. Another point being emphasized is bringing absolutely no brood into the honey house. Caron feels that management is a key to control, but it will take time.

Leaving the East, we now travel far to Nebraska to see Dr. Marion Ellis of the University of Nebraska. The SHB has been in surrounding states since 1999 but there it has not been a serious problem. Apparently the SHB has not been identified in Nebraska but it may have been introduced a number of times without survival. Such introductions but no survival seem to be typical of certain areas. Manitoba, Canada, had an introduction but no survival in 2002. Maine receives SHB with the migratory pollinators for blueberries but, again, no survival. A report from Ohio reflects this same trend – introduction but no survival.

In spite of no apparent problem in Nebraska, Marion Ellis is prepared and plans an education program and applied research to help the state's beekeepers. He is hoping that the arid Great Plains states do not suit the SHB. He is encouraging the Nebraska beekeepers to stay informed.

It would seem that it is safe to take a wait-and-see approach in many areas of the country. In order to do this beekeepers reading this article should try to encourage the isolated beekeepers to stay informed, either through magazines or associations.

In infested areas of the country, beekeepers also need to stay informed but in a different way. They need to keep current on any non-chemical means of SHB control and observe good management and clean, efficient honey extraction practices.

Above all, no matter where you live – do not panic.

The researchers are working hard. Be sure to thank them for their efforts and put into practice their findings. BC

Ann Harman is busy looking for Small Hive Beetle near her home in Flint Hill, Virginia and all around the U.S.

SWARMS

From Spring to Fall, Swarm Management.

Larry Connor

Introduction

My first swarm. It must have been early June because school was out and the apple trees already had small apples. I was about eight or nine years old. The newly immigrated Latvian neighbors had a dozen colonies of bees and one of their swarms had landed about 12 feet up in our huge Northern Spy tree. Mrs. S., the matriarch of the family, a woman who had survived both Nazis and Communists, climbed up one of our picking ladders in nothing more but a sleeveless house dress, and shook the swarm off the branch and into an empty box. Coming down the ladder, she placed the box with bees on the ground, under the shade of the tree, and went home. Later her son walked over and explained in his broken English that the bees were now ours, since they landed in our tree. The Connor boys were in the bee business.

Even then I understood that swarming was an instinctive mechanism honey bee colonies use to reproduce. Like all creatures, honey bees must reproduce to survive, but for them, the survival unit is not the queen but the colony, so the entire colony must reproduce itself. Even in closely related, semi-social bee species like *Bombus* (bumble bees), only the mated queen Winters over All other bumble bees die in the Fall. Not so with honey bees.

A queen and her retinue. When swarm behavior begins, the queen slows, then quits laying eggs, and loses weight, readying for flight.

It seems logical that a large mass of bees in a swarm has a clear advantage over a single queen bee in the survival game. But how did a behavior like swarming develop? There are two traditional theories or explanations for how swarming evolved in honey bees. One is that swarming is an adaptation of absconding behavior, something rare in European bees (outside the mating nucleus), but common in other races and other *Apis* species. When a colony absconds, the entire adult bee population leaves the honey comb nest and flies to a new site, usually in a search for better forage (food) in the new location. Absconding is common in African bees, where annual or periodic dearth periods in the wet/dry Savannah limit foraging, giving colonies few options but to fly to richer locations for forage or perish. Asian species practice absconding behavior too, in the case of *Apis dorsata*, leaving huge combs on an annual basis. When the seasons change, the swarms return.

(Absconding may serve a significant benefit when parasitic mites and certain diseases are present. When the nest is abandoned, mites left in the abandoned brood will perish, reducing the colony mite load.)

Another theory suggests that swarming evolved from mating swarms, groups of worker bees that travel with the virgin queen during her nuptials. Such mating swarms are rare (although reported in some mating yards), but may explain the origins of swarming.

A third possibility occurs to me, and may be related to the mating swarm. This is the business of invading swarms, groups of bees intent on overpowering another hive and dethroning the old queen. This is seen in African colonies where such invading swarms, made of a small number of workers and a queen, overwhelm the guard bees and enter the hive, and kill the resident queen, thus performing a power coup for control of the hive. This is frequently seen in colonies undergoing queen replacement. This behavior helps explain how African genes have so quickly replaced European genes as the migratory bees move into established areas of beekeeping.

Which was first, reproductive swarming or these other behaviors? For the average beekeeper I doubt if it is important – the key fact that all beekeepers should hold in mind is that colony swarming is well ingrained into the genetic programming of bees. The swarming instinct may be moderated, but not eliminated.

Shifting Directions

While honey bee colonies have been issuing swarms for millions of years, beekeepers have apparently been chasing swarms for a few thousand years. For as long as humans have put bees into containers, much like my Latvian neighbor did, beekeepers have relied on swarming to populate new hives. Years ago, the practice was to kill (often by burning sulfur) the bees in the weakest colonies (skeps in much of Europe) and the strongest colonies. Medium strength colonies were strong enough to survive the Winter AND swarm the next season – just what the beekeeper desired. European beekeepers were influenced by the practices of the Greeks and Romans and other earlier civilizations. The European methods of skep beekeeping entered the North American Continent in the 1600s. There were many woven skeps made in the Colonies, but soon the abundance of empty chambers in large trees lead to the development of gum

beekeeping (named after the gum trees found in Virginia and other colonial areas). Still, beekeepers killed many colonies each year to harvest honey until Langstoth's frames entered the culture and changed the rules for colony management.

Moveable frames meant that beekeepers could control the strength of a colony by adding or removing frames of brood, pollen and/or honey from a colony Starting in the late 1900s, many bee journal articles (including many in *Gleanings in Bee Culture*) emphasized the importance of equalizing colonies, a practice followed in most commercial beekeeping operations today.

While the attitudes of beekeepers changed directions, the bees remained fundamentally unchanged. Efforts have been made to reduce the swarming tendency within certain *stocks*, but swarm reduction was done more by the elimination of high swarming *races* from beekeeping operations, the selection of a source of bees (race) that worked for a particular management scheme rather than true genetic change within a stable bee population. Bees still swarm to reproduce the colony unit. Beekeeping management changed to reduce the frequency of swarming through various colony manipulations we will briefly review here.

Pre-mite beekeepers considered colonies of bees to be ageless, almost immortal, since theoretically colonies could keep going for decades without failure. They would produce swarms in most years and keep on producing honey for the Winter A 1970 Bulletin by the British government (Bulletin 206) compared the hive to a river: 'water in the river being the bees, the river itself the colony. Fresh water flows all the time.' I like this image, but it does not apply to colonies with parasitic mites, hive beetles and African bees as we now have in North America. In fact, it was probably never really even close to reality Certainly not any bee operations I knew.

The past two decades certainly have changed the vision North American beekeepers have of colony immortality. Most would settle for a few useful years of longevity and productivity in light of parasitic mites and the development of acaracide-resistance. Still, when colonies are controlled of mites, they will swarm, given the opportunity.

When the bees are nearly ready to leave, activity inside the hive becomes frantic, and bees will begin boiling out of the hive.

The Swarm

Like the traditional parents of newlyweds, a strong parental colony of bees sends its offspring swarm into the world with all the resources the bees can carry with them. While they cannot carry off brood combs and honeycomb they can fill their honey stomachs with the honey riches of the parent colony before they depart and enlist 50 or 60 percent of the bees from the parent colony to create the offspring swarm. By these things, the swarm will have a large labor force able to very quickly build comb, raise brood and forage for new riches.

Wax comb is a high-value asset in a colony both in terms of resources used to produce it, and the role it plays in brood rearing and honey storage. When offered a choice, swarms will move into nests with established comb rather than a combless cavity. No wonder bait hives are so successful when a few frames of comb are present.

The parental or mother colony keeps the balance of the bees, and all the brood. That brood usually yields a remarkable number of bees as sealed brood emerges at the rate

Shortly after taking flight, they alight, to make sure they have the queen, and to determine which new nest wins.

Continued on Next Page

of a thousand bees per day, perhaps more. These young bees supplement the population of bees left behind, and may contribute to subsequent swarms called after swarms, generally smaller in size, sampling from the same, finite number of bees and newly emerged brood. The parent hive also has all the drawn comb, including all the brood combs, stored honey and drone brood. During swarming, of course, there are sealed queen cells, and one or more virgin queens will leave with each after swarm. Bees keep virgin queens apart until after swarming or until the bees have settled the issue of to swarm or to replace the old queen, letting the queens to 'discuss' political control of the hive.

Swarming Theories

Swarming is an instinct, part of the nature of the hive. To eliminate the swarming instinct in bees would be to change the nature of their existence. By definition, a 'domesticated' hive may never swarm, thus no hives are truly domesticated, just feral bees contained in equipment humans are able to manipulate.

There have been no limit to the number of theories as to the cause of swarming. Some of the more popular you will still read in older textbooks include:

Brood food theory – Where there is an overabundance of brood food (worker and royal jelly) in the nurse bees, stimulating the swarming behavior.

Congestion in the hive – The hive is packed with bees and there is no empty comb, no empty cells, for the workers to place the fruits of their foraging

Congestion in the brood nest – Not enough room for queen to lay eggs.

Surplus of wax makers – House bees secreting wax have run out of comb to build

Drones – A large number of drones favors swarming.

Most, if not all of these conditions are present in colonies when they swarm, reflecting common elements of strong colony growth. They do not trigger the swarm response, but are reflections of the conditions of the hive that experiences the trigger.

Swarming and Supersedure Trigger

The most widely help theory today as to the 'trigger' for swarming is the complex feedback system at work in the production and monitoring the level of the queen substance, the group of chemicals produced by the queen bee and spread throughout the hive. The same mechanism is used for supersedure, the process of replacing an old queen without swarming. Since the two different outcomes are controlled by the same mechanism, reports of colonies 'changing their mind' as to swarming are common.

As a queen helps her colony grow in number and size, she produces queen substance. Nearby workers, an ever-changing retinue of bees, remove the pheromone from the queen by feeding, licking and grooming. The bees actively seek this pheromone, but do not stay around the queen. Once they have removed pheromone, they walk around the hive and disperse the pheromone to hive mates. Every corner of the hive gets the pheromone, regardless if a queen visits it or not.

When the colony is large, and perhaps there are no cells for eggs or nectar, when the hive is congested with bees underfoot everywhere, when the wax makers let their wax scales drop to the bottom board, and large numbers of drones are present in a hive, this is when the level of queen substance falls to a certain level. The bees detect this change, and so does the queen detect a chemical modification in her own chemical signal passed back to her by the colony. This stimulates the queen to leave the normal brood area and find prepared queen cups and lays eggs into them. Queen cups are often at the sides and bottom edges of brood combs. These cups are present in the colony all year, even in colonies that died during the Winter. The frequency of these cups increases in the Spring in strong colonies, and just before the queen lays an egg into the cup, the worker bees thin the edges of the cup and make the future cell ready for a developing queen.

When eggs are found in queen cups, and especially when larvae are in development, it should be clear that the colony is on its road toward swarming. A major behavioral line has now been crossed.

As the level of queen pheromone drops, the number of bees foraging for food drops as well; it has been established that queen-right colonies have the greatest number of bees foraging when compared to colonies undergoing supersedure or swarming, and certainly many more foragers than queenless colonies.

Swarm!

About the time the first queen cells are being sealed, the initial swarm leaves the hive. This event is moderated by weather, for most swarms leave colonies on warm, sunny days. Long periods of confinement of colonies in the spring can lead to swarming, since the foragers help pack the hive and dilute the queen substance level.

Prior to swarming the queen was been put on a diet and chased around the hive by workers to cause her to loose the weight of egg laying and to strengthen her muscles for flight. Remember, it may have been several years since this bee flew on her nuptial flight. When conditions are right certain bees become agitated and jump on other bees in the hive and excite them so they take to the air. Scout bees have found a temporarily landing site on a branch nearby, so the bees are able regroup and check that the queen is with them. Between 40 and 60 percent of the adult bees in the hive join in the swarm. Very young and very old bees are not likely to join the swarm. Some drones may swarm too.

From the temporary resting site, the bees rely on the report of scout bees, former foragers, that have searched for empty nest sites. Delegations of bees leave the swarm and inspect these potential sites. They return and report back by dancing, offering the scent of the possible nest. Once consensus is reached, the swarm flies to the new nest and they initiate housekeeping.

Swarming Variables

Not all colonies are going to swarm at the same time. Variables include:

1. Age of the queen. Queens that have not been through a season are less likely to swarm, a strong argument for summer requeening.

2. Genetics/race/strain. Not all stocks swarm with the same propensity as others. All stocks swarm eventually, but not at the same frequency.

3. Crowded hive. Tightly packed hives, too-small nests, will cause early swarming. Even package bees newly hived into shallow comb boxes and given poor ventilation will swarm.

4. Weather. Periods of rain or cold weather keep the field force home, and reduces the queen pheromonal level on a per bee basis.

5. Shade and ventilation. Protected, well ventilated hives must have higher queen substance, for they are less likely to swarm. Is the effectiveness of queen substance temperature related?

Giving the Bees a Home

When my childhood neighbor, Mrs. S., presented our family with a swarm of bees in a cardboard box, we were thrown into the quandary of finding a hive body and frames to get a permanent home for the swarm. We had a commercial beekeeper who lived about a mile away, plus an uncle who had a single hive who could be relied upon for help. A hive body, ten frames and foundation, bottom board and cover were found. The bees were sited in the orchard where they were frequently dosed with DDT and other insecticides, but that is a another story.

Most beekeepers find themselves in a similar situation from time to time, hurrying around to find empty equipment when a swarms lands into their life. It may a swarm from their own bees or from a phone call telling of a swarm that is too easy to let go. While avoiding the endless devices and tricks used for unique swarm situations, here are some thoughts about giving swarms a home:

1. Removing the swarm from a tree

It would be nice if all swarms landed in a small tree or bush about five feet off the ground, and all that the beekeeper needed to do was knock the branch of the tree so the bees fell into the box for moving to a permanent apiary and then pre-assembled equipment. Many experienced beekeepers keep a few 'swarm boxes' ready for just such an need. They usually consist of ten frames in a deep or medium hive body with a mixture of drawn comb and foundation, a bottom board nailed or stabled to the hive body, and a bee-tight lid. A screen is often placed in the entrance so the bees are not able to get out during the drive home, but still have air ventilation.

2. Drawn comb or Foundation?

The use of drawn comb provides a place for the bees to immediately deposit stored honey transported from the parent hive. Honey carried in their honey stomachs and placed into available comb means the hive must start work immediately on cleaning the comb to store this food. The risk of providing swarms with drawn comb is the possibility of carrying American foulbrood spores to the new colony. For this reason, many beekeepers install swarms onto foundation, but sometimes bees will leave boxes of just foundation, so feeding helps to establish a more favorable environment.

Bees that cannot regurgitate the stored honey are going to eventually digest this honey, a process that kills the foul brood spores. This also serves as a stimulus for wax gland secretion of wax scales for new comb production. Swarms on foundation rapidly build beeswax combs, which is usually some of the nicest you'll see – even and smooth and without drone brood cells (drone cells come just a little bit later).

3. Feeding

Feeding continues this stimulation, and the bees store any surplus syrup, so nothing is lost by feeding. Plus, if the weather and season are in full agreement, there should be plenty of natural nectar and pollen for the bees to store. Then, the bees may ignore the feed until a stretch of poor weather sets in. Feeding may be done with a division board feeder, a top feeder (enclosed or in a feeding hole in a migratory lid) or a Boardman feeder at the entrance. Zip-lock bags work fine, especially in a pinch. Medication against Nosema is advised, since smaller colonies often have problems with this adult intestinal disease. Use a 1.1 sugar water mixture, by weight. Watch

Without combs and brood to defend, swarms are generally very gentle – unless they can't locate a new home and begin to run out of the stored food they brought with them. This is called a 'dry' swarm, and they can be irritable.

A captured swarm will march right in a new found nest.

Continued on Next Page

Meanwhile, back at the mother hive, the queen cells are beginning to hatch, and new, virgin queens will battle for control

and those that lose pay with their life.

for leaking containers, and refresh the syrup for several weeks until the colony has no further need for it.

4. Swarm Size

Swarms come in a variety of sizes. Your course of action will be determined by the number of bees in the swarm and what your needs are for bees at that moment. Rather than starting a new colony with a swarm, you may decide to add the bees from the swarm to a weak colony – letting the bees and queens duke it out as to which queen survives. To avoid bee death from fighting (other than a queen) simply shake the swarm of bees onto the entrance of the weak colony. The invading bees overwhelm the guard bees and the bees will integrate quickly while the queens 'discuss' matters of hive rule.

Adding swarms to existing hives is part of good colony management where all colonies are ideally at the same level of strength. Ordinarily you remove brood from strong colonies and add it to weaker colonies. But there are limits on this, since very weak colonies do not have adequate bees to cover the added brood. Shaking bees at the entrance of such hives, either from swarms or from the brood nest of strong colonies (having searched for a queen) is one way to achieve uniformity in strength.

The average swarm is about twelve thousand bees, which is about the same as a 'heavy' three pound package of bees. If you make that visual comparison, then smaller swarms should be used for boosting or combined. Stronger swarms should be hived by themselves and allowed to develop over the season. The exception to this is with late season swarming. Late swarms, regardless of strength, should be combined with another colony It is unlikely that late August or early September swarms will build sufficiently to overwinter successfully (unless you have mastered the art of overwintering nucleus colonies).

5. Transporting Swarms

Like Mrs. S., many beekeepers use a loosely fitting cardboard box to transport swarms. The box is light and easily carried up a ladder to get to a swarm. It may be positioned under the mass of bees and the bees shaken into it. Back on he ground the box may be closed and carried to a new site. If there is a time factor, and the swarm bees will potentially overheat, causing regurgitation, the box should have ventilation holes, even screened cutouts on the top and side.

At home, an old sheet or canvas painting tarp can be put in front of the hive and the bees shaken onto it, in front of the new entrance. Frequently you will spot the queen bee as she walks into the new home. If this is an after swarm, there may be several sister queens in the swarm, all traveling with the bees only to discuss politics later inside the new home. Then the bees will allow the queens to fight until only one remains.

Or the bees may be dumped, somewhat unceremoniously, into the box.

The key to all of this is the queen. If the queen is with the bees, you will keep the swarm. If the queen becomes separated from the bees when you knock the bees out of the tree, then problems will develop, as the queen will return to the old site. Watch for such a reformation, and if the bees regroup in large numbers, shake again to ensure the queen travels with you.

6. Walking the Swarm

To show the role of queen substance, bee researchers and other showoff beekeepers sometimes walk a swarm by caging the queen, and allow the swarm to reform the queen cage either held by the beekeeper or on a stick. The bees then will follow the queen, if done slowly at first. This is a fun thing to do with an artificial swarm made up for a field day of beekeepers or for a bee class.

7. Wax building

Swarms are excellent comb builders, programmed over the eons to produce a great deal of wax because of the honey stored in heir stomach, and from the stimulus the swarm process provides them. Usually, swarm bees have been on break from nurse bee or field foraging for several days prior to swarming, so they are rested and fully engorged with honey Once inside, peak to see the festooning in open spaces between combs as

they secrete wax. As comb is built, you will see house bees chewing at the edges of the combs as they add wax scales and chew the wax to reach its final shape and thickness.

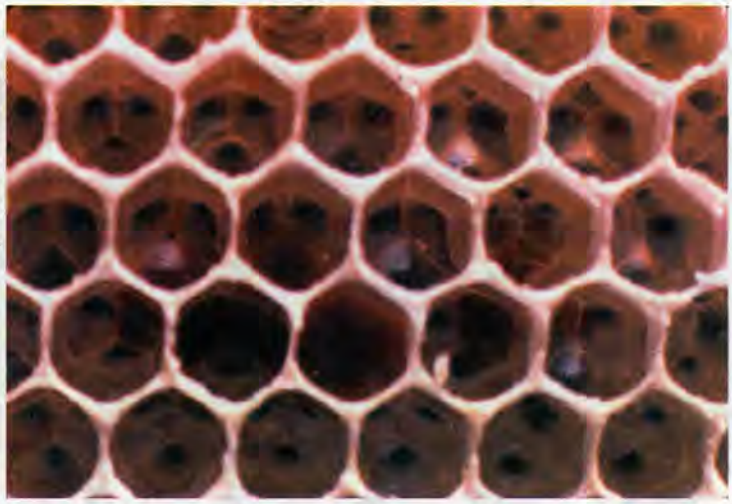
8. Foraging and the light

Experienced foragers will return to the field almost immediately after being introduced to the new home, and will be returning with pollen loads with an hour or two. If your cardboard box allows a few bees to fly, and if you are delayed in getting the bees to the new home, you will find wax built in the box, along with cells filled with pollen and nectar

Darkness, or a very reduced light level, seems to be the stimulus for foraging, which is what one expects inside a permanent nest or hive. But sometimes bees build comb in the open. Temporary swarms sites are usually nondefensive but once they start building comb normal defensiveness is established. Studies have shown that this is a result of a drop in the light level, perhaps several dark cloudy days, and the swarm is in a shaded location. Such open nests will remain all Summer, as once comb is present scout bees no longer search for a new home. Come Fall, these bees are most often doomed in northern climates, since they have no protection from the high winds and general open exposure.

Seasonal Care of Swarms

Once hived, swarm colonies need to become part of the overall apiary management scheme you use. This includes disease and mite management and control measures. Given ideal conditions, large swarms will build in strength very rapidly, so fast, that under ideal conditions they will soon be ready for a second hive chamber or a super, depending on you management system. This may occur when the first cycle of brood starts to emerge a little more than 21 days after installation (giving the queen time to start laying again or the virgin to mate). Swarms do not seem to experience the degree of old-bee die off seen in many package colonies because the bees have decided on the mix of ages and duties of the bees on hand at the time of swarming, even though randomness is a factor in selecting which bees go with the swarm. Given the pre-swarming rest period and the age breakdown of the bees in a swarm, most of the original bees should still be in the colony when the first brood emerges. A robust swarm queen, laying over a thousand eggs per day, may provide about a third of a pound of new bees every day, or about seven pounds of bees during the first 21-day brood cycle. It is no wonder why early beekeepers found swarms so desirable.



A swarm seems programmed to produce lots of clean, well built comb, in a hurry. As long as food is available. Feed if needed.

Swarms for Nucleus Colonies

Swarms with less than twelve thousand bees may be placed into a five frame nucleus colony and managed for queen replacement during the season. No new full sized colony is being created, and the beekeeper will have time to evaluate the swarm queen and her colony. If desirable traits are found she may be used to requeen a poorly performing hive. If her traits are not wanted, then kill her and replace her with a new queen, virgin, or a ripe (nearly ready to emerge) queen cell. Make this part of your Summer nucleus management plan.

Late Season Swarms

There are greater risks for late Summer and Fall swarms. They must build rapidly or will die over the Winter This becomes a judgment call for the beekeeper, who must weigh the availability of proper equipment, the size of the swarm, the risk of mites found in a new swarm, and the likelihood of good forage for the remaining part of the season. Many beekeepers give these swarms a chance at survival, feed them heavily in the Fall, but still lose them over the Winter What advantage is there in this?

Boosting weaker colonies makes much more sense for these late season swarms. Or combine several swarms together If you do not want to keep the swarm queen, then place a fitted piece of queen excluder over the entrance of the hive the bees are being added to and find the swarm queen(s) on the entrance and kill her.

Back to the Future?

Since mites first appeared in North America, there have been many fewer swarms. As mite populations are controlled through genetic tolerance in the bees and with the development and use of mechanical devices (like screened bottom boards), more and more beekeepers will move to a set of conditions more like the early part of the last century, when swarms were common and acceptable as a means of increasing colony numbers.

In areas where African colonies exist, swarms will always carry the risk of very undesirable genetic material. There beekeepers are widely trapping swarms in bait hives and removing them from the picture, often for a fee.

Still, there will continue to be bare armed housewives climbing Northern Spy trees to collect a swarm of bees and leaving them to waiting boys eager to learn beekeeping.

May it always be so. BC

Marking & Clipping Queens

Sue Cobey

Marking provides a visual cue for queen finding. It is also an efficient means to keep track of the origin, genetic background and age of queens. Queens can be given a dab of paint or a glued numbered tag on the thorax.

Various types of paint can be used to mark the queen, though care should be taken to avoid toxic paints. The child-safe paints designed for model toys, such as Testors® enamel works well. Various bee equipment suppliers offer queen paints and paint pens that are of high quality. These can also be found various local stores. Typewriter correction fluid has been used, though this tends to be less durable and is often removed or wears off over a short period of time.

Choose bright colors and ones that provide high contrast to the queen. For example, hunter green on a dark Carniolan queen is less visible than a bright yellow. Colors can be mixed to brighten and add contrast. For example, if green is desired to indicate the year or breeder origin, this can be mixed with yellow or white paint to create a bright, high contrast chartreuse or lime green.

The international color code is used to indicate the age of the queen. Most queen producers follow this when customers request the service of marking. These are; Blue for 2005, White for 2006, Yellow for 2007, Red for 2008, Green for 2009. The colors are then repeated, Blue for 2010, etc.

The plastic numbered disk tags are very useful to more precisely keep track of individual queens. Commercial ones are available in a box of the five international colors, each marked one to 99, with glue and an application stick. The glue most commonly used is a shellac dissolved in alcohol. A quick drying, colorless acetone finger nail polish can also be used as a glue.

Before applying paint or tag glue to the queen, test the amount delivered and the consistency of this on your finger Avoid using paint or glue that is too thick or too fluid. The use of too much or very fluid paint or glue can cause problems. Wipe off any excess on the applicator tip before applying and always test this. If it is too thick, use the proper paint thinner and test again before use. To thin the shellac glue, use de-natured alcohol.

Avoid allowing excess or thin paint or glue to run over the thorax, between the head and thorax or onto to wing bases of the queen. This will not only irritate the queen, it can be harmful. Paint can cover the spiracles, the breathing holes connecting to the tracheae at the wing base. Excess paint can also interfere with wing movements as the muscles attach here. Also take care not to cover the eyes or ocelli; the three small light sensitive eyes on the top of the head.

When applying, center the paint or glue dot on the queen's thorax. A thin stick, similar to a toothpick, can be used. For the numbered disk tags, do not place the glue or disk on the crescent shaped scutellum, this may disturb the queen when she inspects cells for egg laying. The optimal disk size is a 2mm disk with slightly curved edges shaped

The tools you need to clip and mark your queens.

Using a paint pen to mark the queen.

Applying tag glue. Test the consistency and avoid applying too much which will cause the tag to slip off before it dries.

Applying the numbered tag to glue on the thorax.

to fit the curve of the thorax. Larger or misshapen disks often fall off or are removed.

Hold the queen in a stable position during this procedure. She should be secure, but not held tightly and not in a way that she is allowed to struggle or curl her abdomen. Avoid picking up or holding the queen by her wings or legs. In this position she has a tendency to struggle and curl her abdomen, which could be harmful. If the queen is laying, her ovaries are full of developing eggs. The abdomen should be supported.

Pick the queen up gently by her thorax with your thumb and forefinger, so that your fingers secure her along the sides of her thorax. Slip your index finger underneath to support the abdomen. In this position the queen is held very gently, yet securely for marking. She can also be easily herded into a cage in this position.

If right handed, hold the queen in your left hand and mark her with the right hand. Use quick drying paint and glue. After marking, you want this to dry quickly and smell to dissipate quickly If too much paint is used – it may be smeared. If too much glue is used, the tag may slide off before drying.

To practice holding, marking and tagging queens, try this first on a batch of drones. While their feel and activity is different, this will give you an understanding of what is required.

Marking is generally sufficient for queen identification. Wing clipping is generally reserved for special identification purposes. It is often used to identify breeder stock and queens that have been instrumentally inseminated. This double marking system is used in the event a mark or numbered tag is removed. Though, generally a shiny thorax due to a lack of thoracic hairs is a good clue of previous marking.

Clipping a wing is a good identifier, though less common and with good reason. This will not prevent the queen from leaving the colony and not prevent flight or swarming. In this event, the queen's flight ability is impaired and she may simply get lost in the grass or in a low bush. The stimuli that induce swarming remain and are not affected by wing clipping Swarm prevention requires proper beekeeping management before colony swarm preparations are initiated.

Routine clipping of wings is not recommend, as this is more invasive. The wings contain nerves and circulating blood. For this reason wings should never be severely clipped, as this may have harmful effects. As an identifier, removal of the terminal wing tip is sufficient.

To clip the queen's wing the same holding position is used as for marking. Hold the queen gently by the thorax and support the abdomen. Use a pair of sharp, fine, straight edge scissors.

When clipping is deemed necessary, usually only one wing is clipped. There is no reason to clip both wings. A single wing clip can also be used to indicate the year. The right wing is clipped to indicate even years and the left to indicate odd years, though marking colors can serve this same purpose.

Identifying queens helps beekeepers know if and when a queen has been superseded. To maintain highly productive colonies with economically valued traits, it is important to know the age and origin of the queen. Supercedure often results in loss of production and desirable colony characteristics. BC

Sue Cobey is a research technician at the Ohio State University Honey Bee Lab, and also produces New World Carniolan breeder queens. This article is dedicated to Pat Heitkam.

BEAR FENCE RULES

Craig Cella

My 'fenced' trailer.

I live in the center of Pennsylvania, where the terrain ranges from beautiful river bottom farms to remote mountain forests and every kind of inbetween habitat – and you can see a bear in any of them. Bears are very adaptable and learn quickly where to find a meal. A small number of people encourage these bears to come into close human contact by feeding them treats. Some get so used to people that they eat right off of their porches. Then they become problems for everyone, dumping garbage cans nightly, eating from the garden, tearing chicken coops apart, and emptying the well filled bird feeder for dessert. Part of their diet comes from insects in the ground and old hollow logs, but these are found in small amounts and require a lot of work to make a good full stomach.

Sometimes in their travels, which are many and often, a bear comes across an all night, all you can eat smorgasbord containing a complete diet of protein and carbohydrates. Where is this wonderful restaurant? Why, it's your beeyard, with several buffet tables on which that hungry bear will sample three or four, of course, one will be your prize hive that was doing so well. He may even knock a few others over just as a way of make reservations for tomorrow.

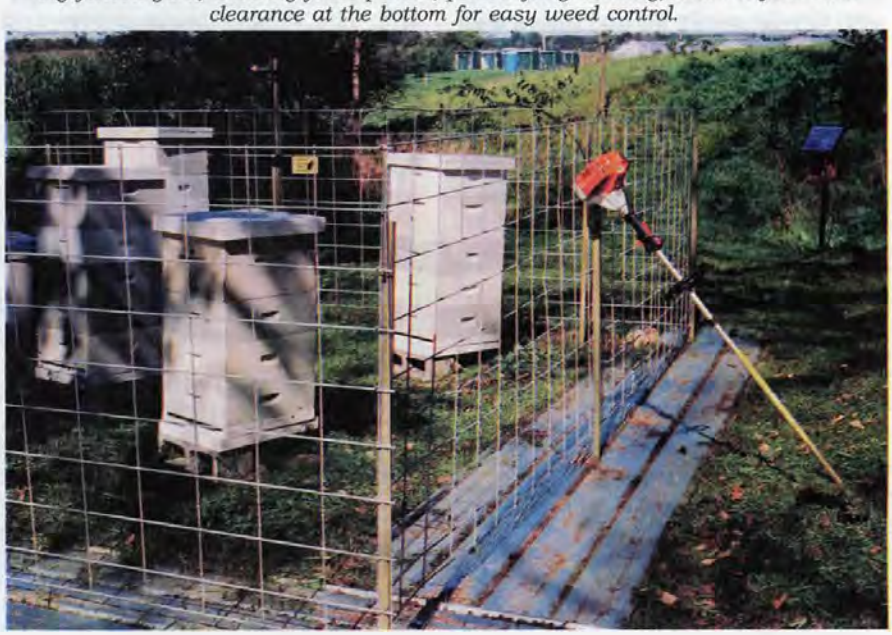
The next time our friendly, easy-going, not-much-bothers-him beekeeper visits his yard you see him change into a raging bear killer – "I'll kill everyone of them." A lot of us have experienced this change. I have.

It is not the bear's fault that over millions of years he survived by eating all types of foods and now someone keeps bees in boxes on the ground. The black bear is beautiful, agile, very powerful and a very good athlete. Everyone should have the opportunity to observe one in their wild domain as he moves about at his own leisure. To see one when it is in prime condition is something you don't forget quickly. The sunlight reflects off of the hair like millions of tiny diamonds as it moves about and then it steps into the edge of the clearing and – gone – like a ghost. It is a wonderful thrill that I've seen several times. If only they didn't like my bees.

Well folks, the bears are here to stay and if you live in a state that has them you will have a problem. I have had bear problems over the years but I never suffered a loss when I had a properly maintained fence – and some of these were pretty ratty.

Bears are unpredictable. Years will go by without a loss and then your yard is on the menu. They may come back again and again or it may be the hit and run type that never comes back again. I've had both kinds over the years. In the 50s I

My fenced yard, showing fence panels, panels for grounding, and the four-inch clearance at the bottom for easy weed control.



Fiberglass posts with nut and bolt fence panel supports.

lived 40 miles west of New York City and bears were something you heard about in stories from Pennsylvania. The man that lives in our old house told me last Fall that he has seen bears up on his back porch – that's a hundred feet from where my hives used to set. They shot one last year in Paterson, NJ, about 15 miles west of NYC. They are everywhere so learn to accept and live with them.

So how do you live with them. Fence your bees in and the bears out. I inspect bees for the state so I see all types of protection, but why someone would set 10 to 15 hives out without any protection is beyond me, especially after he has just finished telling me how a bear ripped them up last year It is like playing Russian Roulette only with five live rounds instead of one. You can build a minimum type fence for the cost of one colony with honey on it or a top of the line fence for twice that. Over the years I have built several different styles and they all did the job, but some are better than others. For several years I only used thin smooth wire like the T V and phone companies use to lash up their cable to the supporting steel strand (cable). It didn't rust, was easy to work with and didn't require much of a corner post or many in line posts.

About every month or two pieces of bacon should be tied to the wire as bait. The bear will touch this and learn what the fence is. The bear must be trained the same as cows, goats, sheep and horses are, so they know what the fence is. Because an electric fence operates in cycles an animal can be part way through before he is shocked – ZAP – now he is through and doesn't know what hit him. He must be shocked before his head is between the wires or you have a high risk of failure. Bacon strips are a good idea for any kind of electric fence.

The Pennsylvania Game Commission has a program for supplying materials to erect deterrent fences for bears if 10 or more hives are in one location on land open to public hunting. They also may pay for damage caused by bear if the bear is not killed, if the affected hives are within 300 yards of the owner's or an agent in charge of the hives domicile, if it is a first time claim, or if a commission – approved, bear deterrent fence has been erected, maintained, and operated. Add a tight budget to these rules and good luck.

The PA Game Commission recommends three strands of 15½ to 12 gauge four-point barbed wire spaced 10", 20", and 30" above ground and will supply an information sheet on erecting a bear fence. I went this route a number of years ago but I wasn't satisfied with the equipment and requirements. I buy what I want now. I know it costs me more money, but one night of a bear visit will be more expensive than a good fence and I will still have to buy the fence.

Kencove (one of the largest fencing suppliers in the U.S. with some very knowledgeable people; 344 Kendall Road, Blairsville, PA 15717, 724.459.8991 or www.kencove.com) does not recom-

Four-inch keeps skunks out, bear out, and allows weed control.

A solar charger. The bigger the fence, the bigger charger you will need.

Continued on Next Page

mend electrifying barbed wire. In their words "it is too dangerous." I agree. I have seen animals become tangled up in a barbed wire electric fence. It just keeps on shocking the animal every second or so because it can't get away. If a person was to get snagged on a barb with his clothing it could possibly end up the same way. Remember, it is the power of the shock, not the size of the wire that will turn a bear.

A few years ago I started using large trailers to keep my bees on – about 24 hives per trailer. I knew I would have to have bear protection so instead of building a fence around the trailer I made up hangers to hold livestock panels along the sides. These look like woven fence but are ¼" thick bar stock welded together in 16' lengths and then galvanized. Tractor Supply sells panels that are welded after galvanizing and they hold up fair. The really good ones are welded, then not dipped in zinc and are manufactured by Behlen Corp. in Columbus, NE, 800.447.2751. They can supply a list of dealers in your area if you call them. The local dealers in my area handle 52" high cattle panels and 34" hog panels. I have always used the 52" just as a safety factor but I really think 34" would work.

A friend of mine from the Pocono's, John Sloan and I were discussing bear problems last Spring in his yard when we came up with the idea of using these same panels to build a permanent beeyard fence. Again Kencove came to the rescue of how to insulate these from the ground, and what to use for fence posts. They sell fiber glass used oil field sucker rods 1¼" in diameter and whatever length you want. They feel like a piece of steel and are about that flexible. NOTE: Always wear gloves when you handle these because of the glass fibers. Do not let the hardware store salesman talk you into something else that will not work as well. I have mine cut out six feet long and drive them two feet into the ground and leave the panel extend above the top. After driving in the posts I stand a panel up on two four-inch bricks and tie it to the post. This four-inch space allows me to use a weed eater for vegetation control while it is low enough to keep skunks out. Skunks are a real problem with the research hives at Penn State University that I help maintain. Once the panels are at the correct height use a drill to make a ¼" hole through the post about 12" down from the panel top at a horizontal bar location. Insert a ¼" stainless bolt with the head on the far side using one washer next and then a nut and tighten. Now screw on the second nut and washer with Loc Tite leaving 3/8" between the two nuts. Now the panel's weight will be supported by the bolt and you can tie the panels to the post with thin wire or plastic ties. Eight posts and four panels with about two hours work and I have a 16'x 16' nice looking beeyard. Bear will sniff and touch but stay out.

We also used 36" wide metal roofing under the panels at Penn State to reduce fence vegetation maintenance and this also gives the bear's feet a wonderful ground to complete the circuit. One end of a panel is simply swung back to provide us with a gate when we are working and then tied shut when we leave.

Another type of fence was used the previous Fall at another yard location for Penn State. When I was first asked to do the field work with the University's bees I asked "how are your bear fences." The answer was: "They don't work but it's alright because we don't have a bear problem." I made temporary repairs to the fence and braced the corners so it was half presentable. The fencer itself was a cheap solar unit but appeared to work. I installed 25 packages in that yard and one week later it was raided by a bear I couldn't find any downed wire so the only thing it could have done was to crawl under the smooth gate wire. The fencer was working and I was stumped. I did my bee work and before I left for home decided to check the fencer again. It was a "sometime fencer – sometimes it worked and sometimes it didn't. So I drove the 80 miles round trip and brought back my own solar Parmak fencer and hooked it up.

About a week later on a Sunday evening while the sun was still up I drove over to check and while doing paper work in the truck cab I noticed something coming down the logging road. It was a beautiful black bear coming right toward me – past the front of the truck within 12 feet of me and then went to each side of the yard. It would stand about the middle of one side and look left and right, after a while it would move to another side and look left and right again. Finally it went back into the brush and laid down. They say a cow can tell if a fence is on or off and I think a bear can also. As poor as this fence was the good fencer kept the bear out.

I rebuilt this fence in the Fall with 6" and 8" x 8' long wood fence post and high tensile wire spaced about six inches apart. I used 1½" pipe between the post to brace one corner against another. One wire was placed about four inches from the ground to keep the skunks out and it made a big difference this year – no skunks. This is a very impressive looking fence but it requires a tremendous amount of labor and I really don't think it is as effective a fence as the panels for bear protection. Live and learn.

Let's talk about the fencer last. It is the heart of the whole fence, for without it you have nothing. The best chain link fence without electric is just an exercise game for a bear, they just go up and over the top, hand over hand. Here I go back to Kencove for more answers.

If you want to get some real technical questions answered then ask for Ken. He recommends a fencer with an output of one joule for bears. Both Penn State and I have been using the Parmak Magnum 12 volt solar unit ($281) with no break-ins from bears (www.parmakusa.com or 800.662.1038). Some fencers are rated with miles of wire they can handle and sometimes it can be very misleading. Those sales people will say anything sometimes to make a sale so it is better to deal with someone you trust and that knows the equipment. The output on the Parmak 12 is at one joule whether it is solar powered or a battery powered fencer ($85).

Ken can build a custom made unit also if you have deep pockets and a real need for more power. Some of the things that determine how large a solar unit you need are: 1) latitude which determines the tilt angle, 2) the average sun hours per day, and 3) the output of the fencer.

Generally the larger the fencer unit (output) the larger the solar panel must be. Also, larger batteries are needed where you have fewer sun-hours per day.

I have a small D cell operated unit called a Yellow Jacket with a 0.25 joule output at a cost of $72.50. I use it where I have only one or two hives on a temporary basis and so far I haven't had any problems but I would not recommend it as a good choice.

People tell me they can't afford to spend $300 on a bear fence and then turn around and lose four or five hives with the season's honey production gone also. They lost all that and *then* they buy a fence. The 110 volt fencers are nice because they always work (when they work) but lightening is about three times as likely to hit the fencer than with a battery or solar powered fencer Just in case you didn't now, those solar units do contain a battery that needs replaced every few years. I didn't know this and years ago I bought a brand new solar unit from a farm store. It had been on the shelf so long the battery was junk. I sent it in to the manufacturers and they repaired it but I was out the postage and time. Again – buy from someone that has a good reputation.

The cost of a 16 x 16 beeyard at Penn State was: four panels @ $25 = $100; eight posts @ $6.90 = $55.20; total = $155.20 plus fencer

Another person I met used wood post with Kencoves "double nail on insulators" to hold the panels. It turned out as a real neat looking job when he was done.

One of the larger queen breeders told me he likes the 0.5" white ribbon for temporary fence. It seems that the bears are fascinated by the way it flutters in a breeze and touch it with their nose. Won't do that again.

All in all bears are one of our smaller problems. They can be managed with a little work and common sense. Of course somewhere or sometime you may have a problem and have to solve it the best way for everyone. It won't do any good to fight with the game commission of your state because they are only able to do so much and now their budgets are tight. If you want more information on this, you may contact me, Craig Cella, 570.725.3682 or Maryann Frazier at Penn State University, 814.865.4621 or visit http:/MAAREC.cas.psu.edu BC

Honey Plants

Connie Krochmal

Crab Apples For Bees

Crab apples offer everything one would want from a bee plant – nectar, pollen, and seasonal interest. Among the most popular of the Spring flowering trees, these are an aid to brood rearing in the Spring. Honey surpluses are possible if the trees are abundant.

Those with home orchards will appreciate the fact that these trees provide the needed pollen for cross-pollinating most apple trees. With a moderate growth rate, most crabs generally prefer full sun in a moist, acidic, well-drained spot. Though a few varieties are hardy enough for zone three, the ones discussed here thrive in zones four through eight unless noted otherwise.

Crab apples are named for their small fruits. These may be yellowish-green, yellow, orange, or red.

Opening in racemes or umbels, the flowers have five, small petals. The bloom time ranges from very early to mid-season and late season. Some cultivars have double blossoms, which aren't recommended for bees. All of the ones featured below are singles.

Crab apple trees come in every imaginable shape and size. With over 600 kinds available, these vary in the color and size of flowers and fruits, and disease tolerance. The latter is critical, for many crabs are typically prone to the same diseases that affect apple trees.

In severe cases, apple scab can defoliate a tree, while fire blight blackens the new growth. Other serious diseases include cedar-apple rust, which occurs when junipers are growing nearby. Due to such problems, this article focuses on crabs with some degree of disease resistance. The native species are good choices, though at times some of these can suffer from disease.

When selecting crabs, the best advice is to choose the old, reliable ones or those that have ranked high in tree evaluations. In consultation with crab apple experts from around the country, researchers at the University of Tennessee released the results of a comprehensive study in 2000, which included a list of the top ten.

ADAMS CRAB

Among the top 10 in the Tennessee study, Adams is a rounded, dense tree. It reaches 20 feet tall and is equally wide. The foliage has a reddish tint, becoming vivid orange-red in the Fall.

Pink in bud, the blooms are initially magenta to red. They fade to pink. Opening mid to late season, these are 1½ inches in diameter Remaining on the tree for several years, the red fruits are very small. Although it resists other diseases, Adams can have outbreaks of mildew and fire blight.

ADIRONDACK CRAB

Also ranking in Tennessee's top 10, Adirondack is 18 feet in height with a spread of 10 feet. This outstanding tree assumes a narrow, upright vase shape. Blooming late in the season, its dark carmine buds give way to red-tinged, white blossoms. The small orange-red fruits last until January. It is completely disease resistant.

BOB WHITE CRAB

A rounded, spreading, densely branching tree, Bob White crab grows to 20 feet tall and 30 feet wide. In cultivation since 1876, this is a long-time favorite. The fragrant flowers, an inch across, appear mid-season. They develop from pink or red buds. This blooms heavier in alternate years. Throughout the Winter, the small, yellow fruits remain on the tree. Nearly disease-free, Bob White experiences touches of fire blight.

CENTURION CRAB

Around 20 feet in height and spreading to 15 feet, this small tree was among Tennessee's top 10. Rather columnar when young, it becomes rounded with age. The young leaves are reddish. They become rust-orange in the Fall. Flowering at an early age, Centurion has red buds and red to pink blossoms. These appear from mid to late season. Its light red fruits vanish before the onset of Winter Centurion is highly resistant to disease.

Crabapple flowers come in white, pink, red and mixed colors. Buds can be red, opening to white or pink or red also.

DAVID CRAB

A rather small crab apple, David reaches 15 feet with an equal spread. It was on Tennessee's list of the top 10. This tree has a rounded shape. Developing early in the season, the pink buds open to white blossoms, 1½ inches across. David has small, red fruits. The dense foliage tends to conceal both the blooms and fruits. For the most part, this tree is pretty much free of disease, but can occasionally get fire blight.

DONALD WYMAN CRAB

Included in the top 10 of the Tennessee study, Donald Wyman crab is a rounded tree, 15 to 20 feet tall with a comparable spread. This tends to be very showy. Flowering late in the season, it blooms heavier in alternate years. The white blossoms, nearly two inches in diameter, emerge from pink buds. Its small, red fruits persist through most of the Winter. Though Donald Wyman is rarely bothered by other diseases, it has experienced fire blight.

LISET CRAB

Reaching 15 feet with a somewhat larger width, Liset crab is rounded to upright columnar Its foliage has bronze overtones, which change to light orange in the Fall. Blooming mid to late season, this tree features dark crimson buds and pinkish-red blooms, 1½ inches in diameter Its maroon fruits are long-lasting.

Liset displays good disease resistance with a slight tendency to suffer from apple scab and fire blight.

LOUISA CRAB

Noted for its graceful, weeping growth habit, Louisa crab is typically 15 feet in height and about as wide. This blooms reliably every year, producing an abundance of pink flowers. Its small, yellow fruits aren't spectacular

Generally, Louisa resists most diseases, but can sometimes be affected by scab.

PRAIRIE FIRE CRAB

An upright, spreading tree, this can be 20 feet tall and across. Prairie Fire ranked among the top 10 in the Tennessee study. Initially reddish, the leaves mature to reddish-green. They provide good reddish-orange Fall color Opening late in the season, the crimson to reddish-purple buds bring pinkish-red to reddish-purple flowers.

The orange-red to purplish-red fruits remain on the tree until mid-Winter. Prairie Fire shows excellent resistance to disease with only a slight susceptibility to scab.

PROFUSION CRAB

One of the most notable red-flowering crabs, Profusion has a large, rounded crown. It is about 25 feet in height with a matching spread. All of the young growth, including the flower buds, is reddish. Appearing in abundance, the lightly scented flowers are initially purplish-red. Later, these fade to rose-pink. They open in bunches of seven or so. The small, dark red fruits last through early Winter.

Though it is mostly unbothered by disease, Profusion can experience bouts of apple scab and fire blight.

PURPLE PRINCE CRAB

This small, rounded tree reaches about 20 feet tall and wide. Initially purple, the leaves mature to purplish-bronze. Purple Prince is one of the best purple-leaved crabs. With a fast growth rate, this tree matures early. Its rose-red blooms develop early in the season. Purple Prince has been available for about 20 years, and is pretty much free of disease.

REDBUD CRAB (*Malus x zumi 'Calocarpa'*)

Listed among the top 10 in the Tennessee study, this dense, rounded tree grows from 15 to 25 feet with almost an equal spread. The leaves display dramatic orange-yellow color in the Fall.

Redbud crab tends to bloom better in alternate years. It has pink to deep red buds. The fragrant blossoms are white to pinkish-white. Nearly 1½ inches across, they open early to mid-season. This tree bears abundant, long-lasting, red fruits.

In cultivation since 1890, Redbud crab resists most diseases. Though the new growth can experience fire blight, the damage is minor

ROBINSON CRAB

Larger than most crabs, this upright, spreading tree grows to 25 feet tall and equally wide. Reddish when they unfold, the leaves change to bronze green. They turn orange

Continued on Next Page

Blossoms so thick you can't see the branches.

during the Fall. Appearing early in the season, the deep pink flowers arise from crimson buds. The small fruits are dark red. Robinson displays resistance to most diseases, but at times it does suffer from scab.

SARGENT CRAB (*Malus sargentii*)

One of the shortest crabs, this species is only six or eight feet in height with a spread of 15 feet. Often lacking a central leader, it has a mounded, dense branching growth habit. The foliage is yellow to light bronze in the Fall.

Sargent crab tends to bloom heavier in alternate years. Its sweetly scented white flowers come late in the season, and are popular with bees. The bright red or purple fruits drop with the leaves in the Autumn.

Overall, Sargent crab remains untouched by disease. It ranked among the top 10 in the Tennessee study.

SUGARTYME CRAB

This upright, round tree grows to 20 feet with about an equal spread. Appearing early to mid-season, the richly fragrant, white flowers are pink in bud. The small, red fruits linger into the Winter months.

Listed in the top 10 of the Tennessee study, Sugartyme resists most serious diseases. Though it can be hit by fire blight, the damage is rarely serious.

WHITE CASCADE CRAB

A graceful, weeping tree, White Cascade is only 10 feet tall with a slightly larger spread. The branches are cascading. Developing early in the season, the white flowers emerge from deep pink buds. It bears small, yellow fruits. This tree exhibits good disease resistance, but sometimes suffers from bouts of apple scab.

NATIVE CRABS

In addition to the cultivated crabs, there are several wonderful native species. Though these are typically found in the wild, they are sometimes cultivated.

American crabapple (*Malus coronaria*)

This eastern species occurs from New York to Michigan and Indiana south to South Carolina, and west to Missouri and Kansas. It forms thickets in the rich, moist soils of woods. Around 20 to 30 feet in height, the American crab develops a short trunk with stiff, twiggy, wide-spreading branches. Slow growing, this is suitable for zones five through seven.

A vigorous tree, the American crab is short-lived. It has sharp spines. The foliage displays beautiful Fall color. This native plant is best known for its stunning, richly fragrant blooms, which open late in the season with the foliage. Initially bright red, these fade to white or pink with tinges of red. They develop from dark pink buds. The fruits are yellow-green.

This is susceptible to scab, and cedar-apple rust.

Oregon crab (*Malus fusca*)

Occurring along the Pacific Coast, Oregon crab can be found from Alaska to Oregon and northern California. Basically a lowland species, it occurs to 1000 feet elevation. This grows in both sun and partial shade. Preferring rich, moist soils, it inhabits river bottoms and stream banks. Though the Oregon crab tends to be slow-growing, the plant eventually forms dense thickets. It grows best in zones one through six.

Oregon crab develops a rounded, spreading crown up to 40 feet tall. Appearing at the ends of the branches, the white to pinkish-white flowers are almost an inch across. These open in bunches of about a dozen. The fruits are yellow to reddish-purple.

This spiny tree is relatively free of disease.

Prairie crab (*Malus ioensis*)

Prairie crab is found from Indiana and Minnesota south to Texas and Louisiana. In its native range, it forms thickets in bottomlands, pastures, prairies, and woodland openings. This tree is best suited to zones four through six.

Prairie crab has an open, rounded crown, typically 20 to 30 feet tall. Slow growing, this spiny tree tends to be short-lived. All of the young growth is hairy. Up to two inches in diameter, the white to rose-colored blooms open in clusters of seven or so. It bears yellowish-green fruits.

This tree shows good disease resistance.

Southern crab (*Malus angustifolia*)

Well-suited to warm climates, this graceful, partially evergreen tree does well in zones six through nine. Its range extends from Pennsylvania south to the Gulf Coast, west to Missouri and Texas. This occurs in open woods.

Reaching 20 to 30 feet, Southern crab is broad and rounded with spreading branches. The heavily fragrant flowers are over an inch in diameter Their color varies from pink to rose.

Otherwise an excellent choice, this tree is vulnerable to cedar-apple rust.

When beekeepers are looking for spring blooming bee trees, they have many suitable crab apples from which they can choose. BC

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

Wild Colony!

Wil Montgomery

Not every beekeeper has a beekeeping friend who wants to run around rescuing feral colonies of bees. Don't get me wrong. I've collected dozens of these over the past 30 years, but my motives are more monetary, unlike my friend who has more noble intentions. He just wants to rescue the bees while I want to collect a fee and get the bees as a bonus!

Having already discussed the soon-to-be-described colony with someone at a craft fair where my friend was selling honey and beeswax candles his wife makes, I assumed they would call me and I'd get paid to come get these bees down from the tree.

But no! My friend is contacted instead and he wants to "just go get the bees." So reluctantly I agreed, knowing full well we could possibly arrive at the site and there would be no bees to collect – another beekeeper already beat us to the colony or some pest control serviceman has eliminated them with a pesticide, or they simply died out from natural causes.

So the day arrives to go "rescue this feral colony" that was described as "just a few feet" from an apartment complex. Close enough to run an extension cord from the apartment to power the vacuum on my bee removal box. A few feet would be true if you had a couple 200-foot extension cords. I only brought a couple of 50-foot cords so when we arrived at the apartment complex and inspected the site, that plan was abandoned.

We found the colony on a small branch about one inch in diameter with three combs of wax and several hundred bees. It was of course just above our reach so my friends got this brilliant idea. Just back the pickup truck under the colony and stand in the bed of the truck to remove it. Guess who got that job while the friend observes from a safe distance taking pictures?

A little smoke and some 20 minutes of trimming branches away from the comb and yours truly is holding the branch, colony and all, wondering what to do with it now. Luckily I had a cardboard box in my truck. After trimming the main support branch it all fit in the box. Closed up and duct taped bee tight with a couple of slits for air and we're headed for the beeyard.

It was about 40 miles back to the house and not a particularly hot day and the bees made it just fine. This is all well and good; but now how do we get the bees into a standard Langstroth beehive? Well with some finagling and minor modifications of a couple standard deep boxes the bees are now safe and sound.

Continued on Next Page

Next problem is to get the queen to migrate *downward*. Don't queens normally like to move *upwards*? We made a partial split from another hive which was placed in the lower box and filled it out with some drawn comb and foundation. Since the natural comb didn't quite rest a bee space above the top bars, a spacer of wood was cut to create that extra space and accommodate the bees moving up and down temporarily.

After a couple of weeks the queen still had not moved downward to the standard deep Langstroth hive body. So I got this idea, why not try and see if she could be smoked out? This went much better than I could have dreamed; but not without mishap for the beekeeper With a generous puff of smoke between the three pieces of comb the queen actually ran out to one side. I reached to catch her by the wings and all I got was a sting on my left thumb. After quickly scraping the sting out I puffed some smoke in the opposite direction into the comb. Well the queen ran out the other side. I quickly reached to get her by the wings again, as I have done so many times when marking a queen, and all I got this time was a sting from a worker on my right thumb. Two for the queen, zip for the beekeeper, unless you want to count the two stings.

Now I did something I should have done in the first place. I went to my bee tool box and got the queen catcher device I use. One more puff of smoke and the queen runs out for the third time. Is this a stroke of luck or what? Swiftly I scooped her up and now she is safely confined to the queen catcher device.

The next to the final step was to release her down

into the standard size brood box and put a queen excluder on top before replacing the tree branch with the natural comb above until all the bees could hatch out.

And the final step was setting the comb branch out where any honey could be robbed out a couple of weeks later, leaving a perfect specimen of a feral colony without any bees or honey.

My friend, Lonnie Funderburg of Oneoneta, Alabama, mounted the entire colony in a clear plastic box after freezing it for a few days to eliminate any possibility of wax moth damage. He takes it with him whenever he goes to a craft fair to talk about bees, sell honey and candles that his wife Bonnie makes. It is a popular attraction and the best part is, I wound up with another nice colony of bees. BC

? DO YOU KNOW ?

Bee Biology

Clarence **Collison**
Mississippi State University

Whether you keep bees for the honey they produce, their services as pollinators, as a hobby, or as a profession, it is important to understand the basic biology and management of one of man's most beneficial insects. Beekeepers need to be able to recognize a few subtle cues that describe the condition of the colony. Failure to observe these signals or interpret them correctly, often results in making the wrong management decisions. The beekeeper has to sense the natural changes that occur within the colony in relation to the environment (seasonal changes) and local floral sources.

Please take a few minutes and answer the following questions to determine how familiar you are with basic bee biology, behavior and colony management.

Level 1 Beekeeping

1. ____ Within the hive drone eggs and larvae frequently disappear during periods of pollen shortage. (True or False)
2. ____ Spring dwindling is a viral disease of honey bees. (True or False)
3. ____ During queen development, larval age affects the quality and quantity of royal jelly received from nurse bees. (True or False)
4. ____ The diet of developing queen larvae is initially high in protein, then as the larvae develop there is an increase in sugars in the diet. (True or False)
5. ____ In large colonies, proportionately a higher percentage of the total population are foragers in comparison to smaller colonies. (True or False)
6. Name two reasons for splitting colonies in the spring. (2 points)
7. What are the three basic steps in making a productive colony split? (3 points)
8. ____ Honey bee larvae are almost totally inactive. They are blind and without functional legs or means of locomotion, and their mouthparts are such so that they can only suck up semi-fluid food. (True or False)
9. ____ Sucrose octanoate esters are being used for the control of *Varroa* mites by mixing the active ingredient in sugar syrup and feeding it to honey bees. (True or False)
10. ____ Sucrose octanoate esters is a new class of insecticides that are produced naturally by the leaves of some plants. (True or False)

Advanced Beekeeping

11. There are approximately ____ different sex alleles in a bee population, all of them at approximately equal frequency.
    A. 5
    B. 20
    C. 30
    D. 10
    E. 15
12. ____ A larva that has two different sex alleles will become a:
    A. normal male
    B. abnormal female
    C. abnormal male
    D. diploid male
    E. normal female
13. ____ A larva that has two similar sex alleles will become:
    A. normal male
    B. abnormal female
    C. abnormal male
    D. diploid male
    E. normal female
14. Name two ways in which queens defend themselves when they fight each other. (2 points)
15. ____ Honey bees are able to exhibit learning. (True or False)
16. ____ Malpighian tubules function in the control of salt and water balance in the bee's hemolymph. (True or False)
17. ____ What is the primary way in which a honey bee loses water? (1 point)
18. ____ In the pupal stage, the small amount of waste excreted, is stored in the gut until emergence at which time it is eliminated as a pasty meconium. (True or False)
19. ____ Carbohydrate reserves in honey bees are in the form of glycogen which is found in the hemolymph and trehalose that is stored in tissues. (True or False)
20. ____ Urea is the final end product of protein (pollen) catabolism or digestion. (True or False)
21. ____ Invertase and digestive proteolytic enzymes involved in the digestion of pollen are produced by the salivary glands. (True or False)
22. ____ Mandibular glands of the queen and worker are similar in size and the drone's mandibular glands are vestigal. (True or False)

Answers On Next Page

?Do You Know? Answers

1. **True** The production of drone brood in honey bee colonies is often related to pollen availability. Drone eggs and brood are tolerated in colonies, as long as forage conditions are good, especially pollen. Unfertilized eggs and immature drones frequently disappear during periods of low pollen availability Worker honey bees consume them to conserve protein.
2. **False** Spring dwindling (also known as disappearing disease, Spring or Autumn collapse) is an observed phenomenon associated with an unexplained loss of bees, not a disease. There is no evidence that any type of pathogen is present. It is believed that this loss of bees is primarily a nutritional problem, but there are numerous other possible explanations.
3. **True** In queen rearing it is important to select young larvae that are 24 hours old or less. Larval age affects the quality and quantity of royal jelly received from nurse bees.
4. **False** Initially the diet (royal jelly) of a developing queen larva is high in sugars, stimulating a high rate of feeding. As the larva increases in size, the diet changes and increases in protein content.
5. **True** As the size of a colony population increases so does the efficiency and productivity. Large colonies not only have a larger number of foragers but also a higher proportion of the population is going to the field than is found in smaller colonies.
6. It is a way to increase your colony numbers or make up for Winter losses without having to buy packages.
   Reduces bee population and congestion in the donor colony, thus reducing the probability of swarming.
7. From the strong donor colony take two to three frames of sealed worker brood,
   Two to three frames containing honey and pollen
   Introduce a queen or queen cell to the split
   May add additional adult bees, shaking them from brood combs
8. **True** During the honey bee larval stage, development is virtually limited to increase in size, without progress in organization. The larvae are almost totally inactive. They are blind and without functional legs. They basically lay in a bed of food and their mouthparts are structured so that they can only suck up semi-fluid food.
9. **False** Sucrose octanoate esters are used to treat colonies against *Varroa* mites by mixing the active ingredient with water and putting it in a garden sprayer. Individual frames with adhering bees are removed from the colony and sprayed with a mist pattern. Two to three passes of the spray wand per frame side provides complete wetting of the adhering bees, while producing minimal drip or runoff. The frame is then immediately replaced in the hive.
10. **True** Sucrose octanoate esters are a new class of insecticides referred to as sugar esters. These compounds have a fatty acid chain attached to a sugar molecule, giving them somewhat "detergentlike properties in water." These sugar esters are produced naturally by the leaves of some plants and have been shown to be effective insecticides for a number of pest species.
11. B) 20
12. E) normal female
13. C) abnormal male or D) diploid male
14. Queens defend themselves by stinging each other until one is killed.
    Queens eject hind gut contents on to the rival queen to cause their rival to be immobilized by the workers.
15. **True** Extensive behavioral experiments have shown conclusively that honey bees exhibit learning and memory. They can learn to distinguish odors, learn and remember shapes, landmarks, tell time of day plus a wide variety of other tasks.
16. **True** Malpighian tubules are elongated tubular glands bathed in the blood that open into the junction between the midgut and hindgut. They are like kidneys in mammals. They contain microvilli which greatly increase the surface area for passive and active transport of substances removed from the blood including mineral salts, water, end products and by products of metabolism.
17. Considerable water can be lost from a bee through respiration. Although the air taken in through the spiracles contains the same concentration of water vapor as environmental air, the air that escapes back out of the spiracles is saturated with water Another route of water loss is by evaporation from the cuticular surface but it is much lower due to the waxy cuticular covering.
18. **True** In the pupal stage, the small amount of waste that is produced is stored in the gut until adult emergence at which time it is eliminated as a pasty meconium.
19. **False** Carbohydrate reserves in the honey bee are present as glycogen which is stored in tissue and trehalose which is found in the hemolymph. These reserves can readily be transformed into glucose. The glycogen reserves are most abundant in the fat body, flight muscles and intestinal tissues. The concentration of trehalose in the hemolymph is an important reserve sugar that can readily be hydrolyzed to glucose which is the high energy food for active muscles.
20. **False** Uric acid, not urea is the end product of protein (pollen) catabolism or digestion.
21. **False** The hexose enzyme invertase or sucrase that is involved in the breakdown of sucrose in nectar into glucose and fructose is a salivary gland secretion. The digestive proteolytic enzymes that are involved in the digestion of pollen are produced in the midgut.
22. **False** The mandibular glands of the queen that produce queen substance are much larger than those found in workers. In the drone the mandibular glands are vestigial.

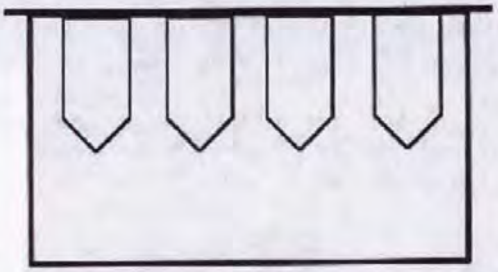
There were a possible 13 points in each test level this month. Check the table below to determine how well you did. If you scored less than six points, do not be discouraged. Keep reading and studying- you will do better in the future.

Number Of Points Correct	
13-11	Excellent
10-8	Good
7-6	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. He is also Chair of the Eastern Apicultural Society Master Beekeeper Program. See www.easternapiculture.org for more information.

Correction

Last month in the May issue we failed to include the drawing that went along with Question #21 in the 'Do You Know' column. Our apologies. We are including the question and the drawing below.



21. The following frame prepared with strips of foundation for rearing queens is known as the _____ method of queen rearing.
a. Miller; b. Doolittle; c. Alley; d. Smith; e. Jenter

Answer: a

GLEANINGS

JUNE, 2005 • ALL THE NEWS THAT FITS

Losses Feared
NEW ZEALAND BOYCOTT

New Zealand apiarists are keeping their bees from one of the main areas for growing squash that are exported to Japan after the loss of some 200 hives between last Fall and Spring.

The deaths in an area of Poverty Bay near Gisborne on the North Island's East Coast followed the introduction of a new insecticide treatment imidacloprid on squash and maize seed.

The East Coast boycott could affect other crops that rely on bees for pollination at the time squash is in flower.

Apiarists in Waikato region in the central North Island, the Bay of Plenty in the North Island and Canterbury in the South Island have also suffered major unexplained losses.

Beekeepers believe the insecticide affects the bees' navigation systems. They said that in France the effect was called disappearing disease because the bees did not return to their hives.

The beekeepers said that they feared even heavier losses if there was widespread imidacloprid treatment of clover seed. Bees often work clover flowers.

The French banned the use of imidacloprid on some crops after it was suspected but not proven that the insecticide had devastated bee populations.

Imidacloprid, the active ingredient in a range of insecticides, is used in soil preparation, seed and young seedling treatment and as a foliar spray, It enters the plant vascular system and kills insects that feed on the plant.

Manufacturer Bayer Crop Science New Zealand said there was no evidence to link imidacloprid with the bee deaths.

Technical and regulatory affairs manager Max Moore told reporters the bee deaths were coincidental with the arrival of the Varroa mite. He claimed there had been no problem reported with imidacloprid in the South Island, which for the moment remains *Varroa* free.

He said Bayer was arranging for European researchers working on bee losses and imidacloprid insecticides to attend the National Beekeeping Association's national conference in Christchurch in July.

The Poverty Bay Beekeepers Association is seeking a grant from the Ministry of Agriculture's sustainable farming fund to research the bee losses. The research would attempt to determine whether the insecticide reached the plant's pollen and nectar and was picked up by the bees. – *Alan Harman*

Varroa Spread Steady In North
ALL OF ISLAND INFECTED

The entire North Island of New Zealand now is believed infected with *Varroa* mite after it was reported found in the Wairarapa region on the island's east coast.

The reported finding of mites in the north Wairarapa areas end the region's status as the last holdout on the North Island.

Varroa has spread slowly but steadily since it was first found in the south Auckland area in the late 1990s. The Ministry of Agriculture has been kept busy over this period redrawing its mite-affected boundaries. That line now is the Cook Strait, the stretch of water separating the North Island from the South Island, which at this stage remains mite-free.

– *Alan Harman*

SAFARI TO TANZANIA

Bees *for* Development is a UK based organisation working to assist beekeepers in developing countries. **Bees *for* Development** functions at the heart of an international network of people and organisations concerned with this field. Our philosophy is to fight poverty by raising awareness of the value of beekeeping for poverty alleviation, as well as to emphasise the role of bees for the maintenance of biodiversity. One of the many ways we do this is through our award winning *Beekeepers' Safaris*.

While **Bees *for* Development** was cooperating with the Njiro Wildlife Research Centre (Serengeti Wildlife Research Institute) in Tanzania, on the six-year research project: *Sustainable Beekeeping for Africa*, many supporters of **Bees *for* Development** requested to visit the Project, hence our *Beekeepers' Safaris* began. *Safari* means 'journey' in *Swahili*, and ours combine travel, adventure, and the experience of African beekeeping with the 'conventional' elements of African *Safari*.

Our next *Safari* to Tanzania will take place **7–21 September 2005**, and includes visits to beekeeping villages, African and stingless bees, and wildlife watching in the famous National Parks. Tanzania is a safe destination in East Africa, and offers some of the best opportunities to see wildlife. You will witness spectacular concentrations of birds and animals, make new friends, and at the same time discover how beekeeping helps Tanzanian people to create worthwhile livelihoods.

Interested? Contact **Bees *for* Development**, Troy, Monmouth NP25 4AB, E-mail: safari@beesfordevelopment.org www.beesfordevelopment.org Rebecca King, Bees *for* Development.

OBITUARY

John Campbell, 79, died on January 22, 2005. From 1993 to 2003 he served as WV State Newsletter Editor and was State Secretary-Treasurer until 2004. The WV Executive Board voted in February, 2005 to name as a memorial "The John Campbell Chapter of the Year Award for Smaller Associations." John had been involved for several years in the annual selection of an exemplary local association.

In 1979, John and three of his friends founded the Tucker County Beekeepers and served as the group's Secretary-Treasurer until his death. In 2001 he and his wife Dorothy were honored as West Virginia Beekeepers of the Year.

After serving in the Paratroopers during World War II, John followed his father in his profession as a surveyor, grafter of fruit trees, and beekeeper in the rural Tucker County region.

He worked for 40 years with the USDA Watershed Project in Tucker County, and was well-known for developing his own quaint sayings, for example, when uncertain of a project's outcome, he would quip, "Who knows what else might come out of the room when the door rots off."

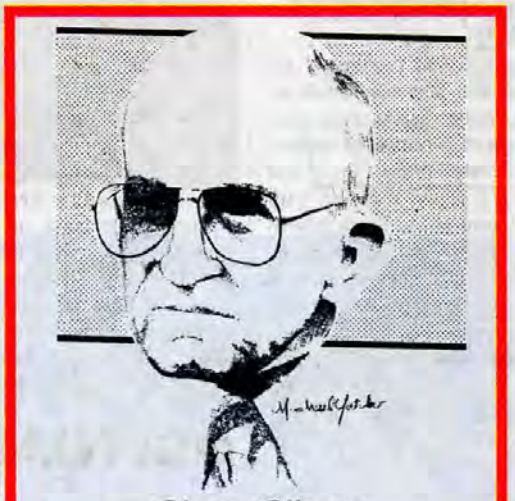
On a gray cold January day, surrounded by family and friends, John was laid to rest. Three surveyors and three beekeepers served as pallbearers.

One short of 20 years ago I had the incomparable privilege of spending three days shaking hands and rubbing elbows with Senators and Representatives in Washington, DC, accompanied, instructed, sheparded, guided and led by Glenn Gibson, honey producer and industry lobbyist from tiny Minco, Oklahoma. Hundreds of honey industry leaders and regular folks have had that same privilege over the years and gained similar insights due to Glenn's industrious and ambitious leadership.

And almost everybody reading this doesn't know who I am talking about, or, at best has a, kind of, vague idea who this remarkable man was. Let me tell you just a little more.

Glenn Gibson was a politician in every good sense of the word. A politician who earned a living making honey. Which is why our paths crossed. I visited and profiled his business in this magazine. I've stayed in his home, ate Sunday dinner with his family, argued with and dismissed his arguments, and listened in awe to his analysis of economics, history and the future of beekeeping, as he saw it.

Glenn lived his whole life in Oklahoma. Born in 1917, he graduated Salutatorian in his high school class in 1935. Soon he was working for Clover Blossom Honey Company, buying, packing and selling honey. Two years later he married his life-long love, Kathryn, who worked by his side in their business, raised their daughter, and edited his writing for the next 68 years.



Glenn Gibson
1917-2005

In 1946 they moved to Minco and began running 500 colonies, eventually getting up to about 1,500. That's when he got involved in the business of local, state and national politics, and he never looked back. Over the years he served on the local school board, was Minco's mayor and ran for Congress (as a Republican in a then incredibly Democratic state). He lost, but barely. Even Barry Goldwater and Dwight Eisenhower couldn't help muster the additional 4% of the vote needed when they helped campaign for him.

Within five years of buying those bees he was involved in beekeeping politics at the National level. Protecting both his business and the industry was certainly important and honey price support legislation was always important to Glenn – at least from 1950-1985.

He was Oklahoma's representative on the Board of the American Beekeeping Federation for more than 20 years. He was president for three years and served as Executive Secretary for a number of years. From then until the late 80s he wrote volumes in this magazine and the *American Bee Journal*. He was keenly aware of the value of consistent, on-message communication with the people who were affected by the politics of protectionism, free trade, pesticide kills, imports, USDA Research programs, the media-elite, loan caps, GATT, the EU and the meaning of it all. From where he sat, he saw bigger pictures.

In the late 60s his enthusiasm with the Federation waned as the futility of trying to marry the interests of honey producers and honey packers became unbearable and Glenn and a contingent of honey producers split from the Federation and formed the Producers-only American Honey Producers. This was the shot that has continued to be heard in U.S. honey politics, and echoes up and down the halls of Congress to this day. The politics became personal and the division ran deep. The fact that, almost always, the decision makers in Congress heard two voices made it increasingly difficult to support any position for beekeepers with this ongoing division, which is as strong, as partisan and as personal today as it was then. Interestingly, Glenn served as President and Executive Secretary of both groups, the only beekeeper to ever do so.

Glenn's writing over the years became as academic as editors would allow, and it wasn't uncommon to read quotes from Ann Rand, Adam Smith and David Ricardo, Blake, Goethe, Dan Quayle, Smoot-Hawley, and a host of other literary and economic greats, and not so greats.

He supported USDA Research Labs, helped establish Dr. Tew's USDA Extension position for African Honey Bees, gained pesticide indemnity funds, hated the media elite, bureaucrats in search of funds, and forever tried to get us interested in economic externalities and price supports.

After 40 plus years of active beekeeping and politicking, Glenn eventually stepped aside for younger voices. Though he had a brief fling at forming another group a bit later, his enthusiasm, and his influence were waning, and by the mid-90s or so he sat back and enjoyed his family, especially his three grandchildren.

He wrote his last article for us in April, 1994, criticizing Clinton's take on the honey loan program, and George Will, Dick Armay and the USDA.

Whether you supported or opposed Glenn's position, he continually made us look at other sides of all the questions beekeeping has, and politics in particular. Glenn made us think, made us mad, made us proud and made us work. But his presence always made us better.

There was no one like him before, and I doubt there will be anyone like him again. If you knew him, you are lucky. If you didn't, know that what you do was, and is, profoundly influenced by what he accomplished in his life.

Glenn Lewis Gibson, 1917-2005. Survived by his wife, Kathryn, daughter Glenda and son-in-law Jim Ross, and grandchildren Lucas, Jamie, and Marcus.

Archive Completed

DR. WHITE RESEARCH

The scanning and processing of the Dr. Jonathan W. White, Jr., papers has been completed by the Penn State University Libraries Preservation Department in conjunction with the University Archives. Dr. White, an internationally recognized authority on the analysis and composition of honey, contributed enormously to knowledge about honey during his 60-year career.

The Penn State University Archives, Special Collections Library, at Pennsylvania State University, has transferred all Dr. White's materials to acid-free folders and has created a finding aid that lists all materials in the collection. Dr. White's published articles will be available in the future via the Internet, **www.libraries.psu.edu/speccolls/FindingAids/white.html,** and are listed on the Libraries' online catalog system.

The National Honey Board provided funds for the preparation of Dr. White's collected works for public use. By preserving his work, the honey industry (and other interested individuals and companies) have the ability to use Dr. White's research in perpetuity and access and utilize the research in their own projects.

Dr. White was a native of Pennsylvania and received a B.S. in Agricultural and Biological Chemistry in 1937 from Penn State University and a Ph.D. in Agricultural Chemistry from Purdue University. Dr. White worked for the United States Department of Agriculture (USDA) from 1942 to 1978, at its Eastern Regional Research Laboratory in Wyndmoor, Pennsylvania, where he conducted the majority of his honey research. After White left the USDA, he worked as an independent analyst and consultant on honey, first as president of Honeytech, Inc., and in 1987, for Honeydata Corporation.

Dr. White had more than 140 professional publications and six patents to his credit. He also collected relevant research publications dating to the late 1890s. The complete collection contains eight series: Apiculture, Beeswax, Biological and Medical Research, Chemistry of Honey, Codex Alimentarius, Food and Food industry, Publications, and Personal. The Jonathan W. White papers were donated to the University Archives by Dr. White and his daughter, Dr. Barbara Pennypacker.

For information about the archive, contact Special Collections at 814-865-7931, or Jackie R. Esposito, University Archivist, at jxe2@psu.edu. Contents of the collection finding aid can be viewed at **www.libraries.psu.edu/speccolls/FindingAids/white.html.**

CONVICTED

A British Columbia man has been fined C$10,000 after being intercepted trying to smuggle bees from the United States to Canada.

Dudley Paul Gottfriedson of Osoyoos was convicted in provincial court of one count of violating the Honeybee Importation Prohibition Regulations, 1999 made under the Health of Animals Act.

The court was told that on May 28, 2003, Gottfriedson attempted to import 8,416 queen honeybees, valued at C$84,160.

Osoyoos is in the southern Okanagan Valley and is about five kilometres (about three miles) from the U.S. border.

Canada Border Services Agency inspectors discovered the bees upon a secondary examination of the vehicle. The bees were destroyed immediately after seizure except for a sample that was retained as evidence.

The Health of Animals Act and related regulations prohibits the importation of live honeybees from the U.S. except under certain limited conditions. The Canadian Food Inspection Agency is responsible for enforcing a variety of legislation including the Health of Animals Act and Regulations, delivering inspection and related services that contribute to improving the overall integrity of the food safety, consumer protection, plant protection and animal health systems.

National Advertising Campaign

BILLY BEE TAKES FLIGHT

Canada's Billy Bee is literally flying high in its first-ever national advertising campaign featuring a six-week radio and television buy that will reach more than 40% of honey consumers between now and the middle of April, 2005.

One of the two TV spots, (using the "The Flight of the Bumble Bee" as musical background), features a boy squeezing honey onto his toast at breakfast as a "natural way to start the day," while the other shows a woman sweetening her tea by "squeezing her honey" from Billy Bee's famous beehive-shaped plastic bottle.

Both of the 15-second TV spots close with an animated Billy Bee flying out of the famous Billy Bee honey label for his 'close up'

A 30-second radio spot promotes Billy Bee honey as a pure and natural sweetener for use in recipes as well as on toast, in tea and coffee, and urges consumers to "create a little buzz of your own"

"Billy Bee honey is a natural, healthy alternative to processed and synthetic sweeteners, and we believe health-conscious consumers are looking to make healthy eating choices," says Billy Bee CEO, David Sugarman, who was hired despite his last name.

"Honey consumption rose 25 per cent between 2003 and 2004, and we are hoping our national campaign will result in another significant increase this year," adds Billy Bee Vice-President of Sales and Marketing, Ralph Grossman.

Billy Bee is expanding into other honey-related products adding new products such as a complete line of honey mustards for its Canadian and U.S. customers and will be introducing new packaging labels across its line of current products to contemporize and update the Billy Bee family of products.

Billy Bee is Canada's favourite honey brand, with more than four times the market share of its closest competitor. Billy Bee's advertising campaign was designed by The Brand Marketing and Communications Group of Richmond Hill, Ontario.

TSUNAMI HELP

British-based Bees for Development Trust said it was working to help with the reconstruction of beekeeping in the tsunami devastated areas of the Indian Ocean.

The trust said it did not usually become involved in "giving equipment" type projects, this was an exception.

"Obviously, people will have lost their equipment, and helping them to get started again in beekeeping can quickly help them towards recovering their livelihood," it said." It seems that even the fruit trees are being killed by the salt overdose, and assistance in reforestation will be appropriate. Bees for Development welcomes other bee-related organizations to join with us in this task."

The trust said areas affected by the tsunami are parts of the world where Bees for Development has enjoyed good links with partner organizations.

"It may be possible for us to use established local networks for making equipment and distributing local aid to established and new beekeepers and their families," the trust said.

The trust is a charity that helps people in developing countries to help themselves through beekeeping. Its assistance takes the form of free information and advice for beekeeping projects, groups and individuals in developing countries. Information on all aspects of beekeeping is provided: how to build hives, market honey, manage bees sustainably and create resilient livelihoods.

Display Advertisers

Every few weeks a farmer dumps a spreader load of cow manure on our garden in exchange for a load of clean planer shavings from my lumber business. One day Dick was in his spreader packing the shavings as I shoveled them out of the bin through a narrow shoot. Dick stuck his head up the shoot just as a shovel load of shavings came down. He wiped his eyes and spit out a mouthful of sawdust. "You still want that bee's nest?" Dick had been telling me about a giant swarm living in an ironwood log for at least 10 years. He was sure I needed it. "My neighbor is hiring a portable band mill next week. I'm taking down some trees and hauling some logs over At the same time I want to drop that bee tree in the pasture before it comes down by itself and takes out the fence."

Dick was sure another colony of bees would be a great thing for me. He didn't want to cut the tree into firewood with a mess of angry bees buzzing around him and thought I could help. He'd get the firewood and I'd get the bees. I guessed they already had American foulbrood. I'd introduce it into my yard and in a year all my bees would be dead. No bees – no stings, no hot sweaty work, no more dead colonies, no more bee poop on the sheets hanging on the clothes line...

"Sure!" I shouted down the shoot. "Just let me know when it's down."

A week later Dick called. "I dropped that tree. Man alive, that's one big swarm of bees! You better come right over "

I drove to Dick's farm. He led me behind the barn, unlatched the electric fence gate and closed it behind us. A large bull stared at us from a distant corner of the pasture.

"He dangerous?" I asked.

Dick looked around. "Oh, that's Frosty. He's just a big marshmallow."

Strings of saliva dripped from his jowls. He lowered his head and shook his horns. Dick continued up the hill swinging his walking stick. I thought the "marshmallow" looked more like a rabid rhinoceros. I turned to catch up with Dick. Dairy farmers all seem to walk oddly, kind of a slow loose gait. Perhaps it's from bending under cows for hours every day. Maybe it's the result of being charged from behind by mad bulls.

Dick was still talking as I caught up. " so I says to Bruce, I'll just chain the log to the bucket on the tractor and " He paused. I thought it was odd to hear thunder on such a bright sunny day. Dick turned toward me and swung his stick. I ducked. He wasn't aiming at me. "Frosty, you calm down!" Frosty swerved like a freight train as the stick cracked over his withers. "Bad Bull!" Dick tossed the stump of his walking stick toward Frosty and turned to me apologetically. "Soon as we're out of sight he'll leave us alone." Frosty glared sullenly after us. Once we entered the woods, I kept a tree between me and Frosty. Dick ignored him.

"Here it is." Dick stopped at the felled ironwood. "I dragged it from over there," He waved toward a stump a couple hundred yards away, "but the bees kept going after me. I just cut the engine and ran – came back after dark and got the tractor " The cavity had broken open. A small cluster of bees huddled on broken comb. Most of the field workers were gone, lost when Dick moved the tree.

"Ah...would it be too much trouble to drag this out of the pasture? I uh..."

"Heck, I'll ...you could chain it to the bucket and I'll set it down right over the fence. You got one of them suits I could put on?" Dick worried more about the bees than being gored by a bull.

Before returning to the barn, Dick casually picked up a cudgel shaped limb broken from the ironwood log. "This would make a nice walking stick," he muttered. I stayed behind Dick as Frosty glared at us.

By evening I had cut and split almost one face cord of ironwood for Dick and acquired almost a pound of queenless bees and a bucket of dirty honey and comb. I picked out the cleanest comb and gave it to Dick's wife. Ellie rolled her eyes at me. "Dick can eat this stuff himself. Did you boys have fun?"

"Well, yes – although I never actually saw Dick once I started cutting up the log."

A few weeks later Dick came and dumped a pile of steaming fresh manure next to our garden. He backed the spreader under the sawdust shoot. He took a long time climbing off the tractor, then limped back and eased himself into the spreader.

"What happened?" I asked.

"Frosty charged me once too often." He gingerly patted his gluteus maximus. "He's now in the freezer. You in the market for beef?" I wrote out a check for fifty pounds of ground beef. As tough as Frosty looked in the pasture, it turned out he had a tender side, grilled medium rare.

Peter Sieling

The Bulls And The Bees

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