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AUG 2005

Bee Culture

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Milkweed produces a wonderfully delicate, light honey that's too-often mixed with other nectars. Lovel, in Honey Plants of North America, says the flowers are called 'Pinch-Trap' flowers. They contain two club-shaped masses of pollen, attached by a flexible band, with a wedge-shaped slit at one end. A honey bee's foot can become ensnared in this slit, which works something like a child's Chinese finger trap. The bee can become trapped and starve on the flower, or, if fortunate, pull away, taking the pollen sacks (called a pollina) to another flower, ensuring pollination.

Mike Yatcko photo

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

AUGUST 2005 VOLUME 133 NUMBER 8

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There's still confusion over the meaning of Bee Cautions on pesticide labels. This will help.

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The first Australian packages, and who sent them.

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NEW JERSEY'S RESPONSE TO THE EFFECT OF URBANIZATION ON BEEKEEPING 54

Urbanization has increasingly compromised opportunities for beekeepers. Here is one group's reaction.

Cynthia Ann Werts

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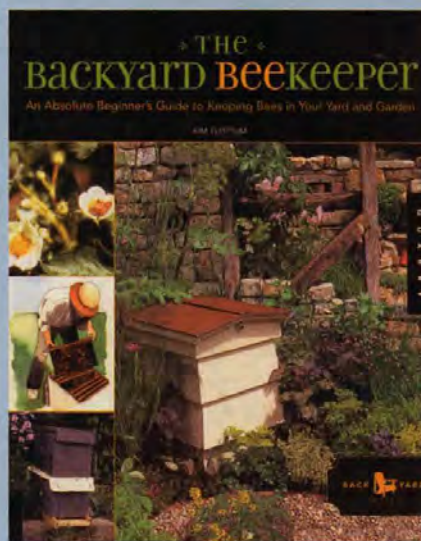


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Answers In Russian

I am writing to you about my experience with the Russian honey bee. I have been a beekeeper for about 35 years and have always loved beekeeping. I am now 65 years old. I have read many books about beekeeping and also took a class in college. One book I remember reading was *The Joy of Beekeeping*.

At one time I thought the Italian bee was without a doubt the best bee there was, then almost overnight the mites came along. At first it was the Tracheal mite. I tried everything, menthol, the Crisco pattie, and all I was doing was fighting a losing battle. I got out of the beekeeping for about five years, the mites took the joys out of beekeeping for me. Beekeeping was a joy when all you had to worry about was foulbrood, chalkbrood, etc. Then I heard about the Russian bee and for over a year I read all the information on it I could. The University of Louisiana was a great help, as were other sources.

Six years ago I ordered one three-pound package and a five-frame nuc with a marked Russian queen from Hardeman Apiaries, and I have found them to be honest people. I ordered a three-pound package from a place in Louisiana.

Now, this is the point I want to make, for the six years that I have had these Russian bees, I have not treated my bees for mites in any way. I have not seen any sign of either one of the mites, and I know what to look for. This year on April 7, I installed two two-pound packages. I checked them on April 29, they looked great with solid frames of capped brood.

The bee is very easy to work with. Last year I extracted 10½ gallons from four hives. I thought this was good. I think the Russian bee could be the answer to the mite problem.

Robert L. Chase
Rienzi, MS

Betty Crocker Saga

In the May issue of *Bee Culture* we printed a letter from



Comments
Suggestions
Criticisms
Kudos, and
anything else

Bob Rauch about Betty Crocker's Honey Butter Popcorn that contains no honey. We also printed the vague response we got from Betty Crocker when we challenged them and asked our readers to visit the website and challenge them also. Below are responses to two of our readers from General Mills about the popcorn. We encourage the rest of you to visit their website and send a message about the use of the word honey in a product that contains none.

Dear Mr. Waldmann,

Thank you for contacting General Mills with your inquiry. The honey in the Honey Butter Pop Secret popcorn is artificially flavored.

We hope you find this information helpful. Please let us know if we can help you again.

Dear Ms. Damerow

Thank you for contacting General Mills with your inquiry. The reason there is no honey in the Honey Butter popcorn is because natural sugars will scorch at the temperature required to pop popcorn.

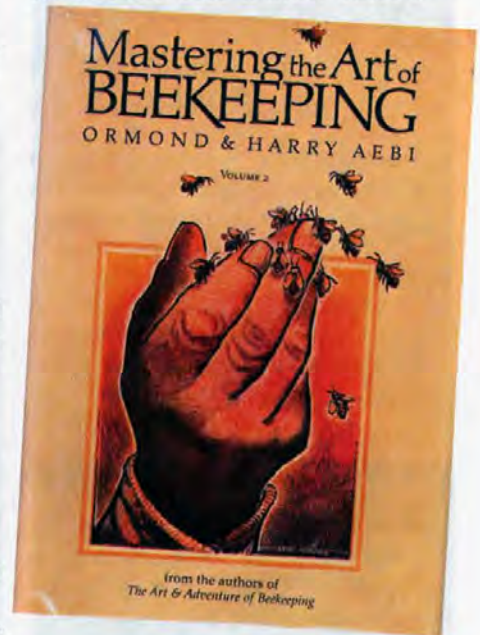
We hope you find this information helpful. Please let us know if we can help you again.

These letters were signed by Consumer Services at General Mills.

Good Books

I was wondering why nobody is talking about the beekeeping books by Ormand Aebi (*The Art and Adventure Of Beekeeping* and

Mastering The Art Of Beekeeping)? These are the best books on beekeeping I have ever read and I've got a lot of them. Especially the tip about smoking yourself a lot and the bees a little. Since I



read and have used this method I'm almost embarrassed to wear a veil. They are completely not interested in me since then. What a change!

His use of an extended landing board and grounding the excluder are great ideas and at least the extended landing board should be used by those that are able.

Hope this gets some interest going. These guys were great beekeepers with an answer for every problem.

Micah Harrari
Israel

Old Honey

I am 15 years old and help my uncle who is a beekeeper. I have three hives of my own. I have a

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question that he was not able to answer and suggested I write to you.

If we have some old honey that is crystallized in the frame can we feed it back to the bees and will they turn it back into liquid honey so that we can extract it? Or do they pack it back into the cells as crystallized honey?

Michael Berrow
Bakersfield, CA

Editor's Note: If you can, keep it until next Spring, in a freezer. Use them to feed packages or weaker colonies. Remove from the freezer for a couple of days, then scratch cappings off with a fork or scratcher. The bees will use it then by adding water and dissolving the crystals. It's then used to grow bees, not to store.

When Lightning Strikes

The photo is of one of our backyard beehives that was struck by lightning during a June 20, 2005, thunderstorm over Oak Ridge, TN. The 6½ foot tall hive exploded killing more than half of the hive's 80,000 or so bees and scattering hive pieces and more than 200 pounds of honey over an area about 40 feet in diameter. Monetary loss is placed at approximately \$800.

The Sloop Family
Oak Ridge, TN



Sideview after lightning strike.

Feeder Comb Honey

A number of years ago, a friend of mine told me how to feed bees syrup with a Ziploc bag and I've been doing it ever since. I do it by making a frame the same size as a beehive, 16¼ x 20, but only 2½ inches high. Take cover and inner cover off, place feeder frame on top of last hive body. Fill Ziploc (gallon size) about 2/3 full. Place this on top of bees inside of feeder frame. Then with a sharp knife make a slit in bag about four inches long, put cover and inner cover back, and forget it until next feeding time. If bees are strong syrup will be gone the next day.

Now what happens if you leave feeder on and a honey flow starts. You will have a lot of comb started from the inner cover down. This used to upset me, but I found if you try to get inner cover off the combs will be ruined. But if you pry feeder and all up you will find that the comb isn't attached to top bars or Ziploc bags, but will be nicely rounded off on the bottom side so now all you have to do is remove feeder bags, put a super, and replace feeder and comb on top. Keep moving this up each time you put a super on and by harvest time you should find you have some nice comb honey, that can be carefully cut away from inner cover. What I do is cut it in lengths and wrap in plastic wrap and place in freezer until needed or sold.

Joe Cowan
Aberdeen, WA



Front view before.

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INNER COVER

Good things are happening. The USPS has decided that sending the Mite-Away pails through the mail wasn't going to cause the end of the world as they knew it, so they'll handle them as regular mail. UPS followed suit. If you plan on using these pre-soaked formic pads this Fall, you'll be able to get them without taking out that

second mortgage.

Drone comb removal, long championed as a way to reduce *Varroa* in a colony finally has some good northern U.S. data for support. Time will tell if it works well enough long enough, but it works good enough to reduce at least one treatment a year, maybe more, and maybe more than that.

Immediately some argued that it was too difficult for large outfits 100s, 1000s of colonies – because of the labor involved. Especially now, when honey from Argentina and other countries is again flooding the shelves of grocery stores, those large U.S. operations are income stressed even more. Probably. But for many of us it is one more safe tool we can use.

Add to that the multi-nozzle Sucroside sprayer boom that's out and you have two safe *Varroa* control tools for medium sized operations. That's good news any way you look at it.

But that \$0.55 per pound honey price just mentioned isn't good news for producers for several reasons. Of course it is good news for packers and importers and retailers I suppose. It continues to grate, doesn't it U.S. producers pay to get consumption up, and when it is, they get pushed aside in favor of inexpensive imports. I predict a nasty Winter this year

American foulbrood resistant to terra is spreading, and that's not good news at all. It's moved from those areas where the big guys are concentrated and is spreading out pretty fast. Just under 5% of the colonies in my county alone can't shake it this summer. That's a lot, and it's getting worse. Check yours for signs, and get it tested if need be. Unless something happens soon with Tylosin, for those that treat, there's gonna be a bonfire down here they'll seen from the space station. What's worse though, is that already there's rumors that U. S. honey has been found with Tylosin residue, and some honey has been returned because of it. I don't have a shred of evidence . . . maybe it is just a rumor Let's hope so.

The price spikes in honey prices the past couple of years have been anomalies and everyone knows it. Honey contaminated with antibiotics was pulled from the world's markets and the reduced supply and continued demand caused the price to be bid up by importers and packers. It took awhile but there's clean honey now, we're told. Too, some colonies were pulled out of honey production to take advantage of increasing pollination rental prices reducing domestic production even more. And just plain fewer colonies out there – fewer beekeepers, and more dead colonies (see rAFB, above) – reduced production some, too. But all good things are globally resolved, and that world oversupply is back on line, and prices are plummeting – at least on the bulk market.

Pollination prices, however, are not dropping as fast and almond rentals next year are still in the \$100 range, I hear I suspect next season there will be a tad more scrutiny on quality since growers are keenly aware of the situation, and the price. The market for out-sourced pollination – that's imported bees – is a ques-

tion though, as domestic suppliers gear up earlier this year, and quality and quantity will be, one hopes, better

But, with imported honey prices low, pressure will be on every honey seller to pay attention to costs and other income opportunities. This will all filter down – imports, pollination, foreign honey on store shelves, steady demand, fluctuating supply, and wildly changing quality, so be prepared. Pollination may be your bread and butter so now is the time to prepare for contracts, moving, colony health next Spring, acquiring colonies, or preparing to sell bees late this Fall to others who will pollinate. Yes, extraction is at the top of the list, but the rest should be very, very close.

And finally, there's some good things. HAS, The Heartland Apicultural Society celebrated its fourth birthday in July. With the exception of a maniac jack hammer serenade one day it was a pretty well run meeting. It's a bit more organized now, with a bit more of a plan, and with perseverance and some luck will grow to see many, many more. WAS, the Western Apicultural Society celebrates 30 years of service to their beekeepers this year, and EAS, the Eastern Apicultural Society, and the Godfather of these two does its 50 year Anniversary dance early this month. Thousands and thousands of beekeepers, from all around the world are better at what they do because they attended one or more of these regional meetings over the years. That is a legacy all three groups should be proud of.

And there's faint rumblings of a revival of the Southern States Beekeepers in the next year or two also, I hear With the kind-of commitments from several state groups so far, and some from regional businesses, this, too, could once again be a great service to the beekeepers of that region. If you're from the U. S. Southeast, you might want to ask your state group, and local businesses if there's a chance this could happen. Ask anyone who's been to an EAS, WAS or HAS meeting if it's worth the effort. I guarantee you won't be disappointed.

Tom Hatten

Good Things &
Bad Things

GUEST EDITORIAL

PESTICIDES, LABELS AND HONEY BEES. LET'S BE CLEAR . . .

Jeff Anderson

Yep, it has to be *Varroa* mites.

I'm a commercial beekeeper, not a writer, and this article took me hours to compile, organize and write. It is not a novel, it is not exciting, but if you care to be a long-term beekeeper you need to read this until you understand it. Everything not in quotes is my opinion. What triggered this article was Jim Bach's, "Pesticide Labels, Do they protect bees," in the June issue. Jim's premise is that any insecticide can be applied according to any label at night and cause significant bee mortality the following day(s) and not be a violation of label. I DISAGREE. We have standing under the law.

Are you aware that Fungicides cause what appears to be chalk brood for weeks? Are you aware that agricultural pesticides can cause miticide resistance in you hives? Are you aware that surfactants can magnify the effect of a pesticide up to 100 fold? Are you aware that crop oils can extend the pesticide toxic life extensively? Are you aware that some polyacrilimides (plastics added to pesticide sprays) can suffocate your bees even without any pesticide? Are you aware that microencapsulated insecticides are known to kill bee colonies over a year after application? *Pesticides can be a problem*, and I am grateful that there is an increasing interest in pesticide issues and I applaud *Bee Culture* for continuing to tackle this subject. After reading Jim Bach's article in June I felt compelled to address the Bee Caution issue. I was dismayed that Mr. Bach (he investigates Washington State bee kill incidents) seems to not understand the differences in the bee cautions. ***It is a violation of Federal law to kill pollinators (bees).***

Pesticide regulation comes under the *Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)*, first drafted in 1947, that has been amended several times, most recently in 1996. In 1947 in response to the FIFRA legislation states formed the organization American Association of Pesticide Control Officers (AAPCO). Their original intent was to help individual states maintain uniform handling of pesticide issues. With regard to pesticides Congress drew the line... FIFRA 404 Final Interpretive Rule excerpt "*Congress charged EPA with regulating pesticide use in a manner which will prevent unreasonable risk of pesticide exposure to man or the environment. (Everything that is not 'man' is by definition, environment) Congressional intent would not be carried out if EPA encouraged pesticide users to engage in unsafe activities by not charging violations in cases where no actual harm occurred.*" But individual states handle the day to day regulation and Enforcement of Federal pesticide laws through "Primacy", a delegated, Cooperative Agreement¹. This program is essentially a contract and EPA is responsible for a yearly evaluation of each state's performance. EPA has the right to withdraw 'Primacy'² from states that have inadequate laws or enforcement policies. EPA partnered with state agencies have full control of ALL pesticide enforcement. Local law enforcement has no jurisdiction over pesticide issues.

Today, on the AAPCO website³ their current mission statement states, in part, "To promote the usefulness and effectiveness of pesticide products" I think your state

pesticide regulator thinks that it is his or her job description to promote pesticide products.

During the 1990s bee colonies were killed wholesale by PennCap-M. In August 1996 at a Nebraska AAPCO meeting, North Carolina, Nebraska and Washington enforcement agencies explained their pesticide enforcement "success stories" to EPA. Bee kill complaints had tapered off - some statistics: In 1990 North Carolina had 25,000 hives, 1996 12,000. In 1990 NE had 118,000 hives, 1996, 65,000. Washington State mentioned that their hive count was the lowest since 1914 and bee complaints were off significantly; no bees, no complaints.

Here's more: In 1997 AAPCO wrote EPA, suggesting they make the protection of foraging honey bees an advisory warning, only. AAPCO's response to the PennCap-M losses was to 'eliminate' the law. Your regulators proposed to make Federal Law into advice only If pesticide damage conflicts with AAPCO's mission statement, ("To promote the usefulness and effectiveness of pesticide products") their enforcement posture is to eliminate the law. And EPA relies heavily on AAPCO when making its decisions. Let's ask the fox how to protect the hen house, should we?

In 1998 EPA's response the PennCap M question "Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area," explained by Jim Downings⁴, head of the EPA labeling committee. Here is how he broke it down...

1) Q. What is the "treatment area"?

¹48 Federal Register 404 Section 26(a)

²48 Federal Register 404 Section 27(a)

³ <http://aapco.ceris.purdue.edu/html/mission.htm>

⁴ Email Exchange Jim Downings

A. The actual area treated; for example, a corn field or fruit tree orchard

2) Q. During what time period would bees have to visit or forage in the treatment area to trigger the prohibition?

A. ...during the time of bloom that bees are or could be expected to visit or forage a blooming crop or weed, no applications of the pesticide can take place. This would typically be for up to a couple of weeks during time of bloom.... for pesticides with residual toxicity to bees if there's crop bloom or blooming weeds attractive to bees, then the potential for bee kills exist. Therefore, mitigation measures must be in place.

December 1999

SFIREG, a sub committee of APPCO, had as a HIGH PRIORITY ISSUES Mosquito adulticide labeling issues. [12/99]

Most mosquito adulticide labels include the standard bee precautionary language, "Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area." Strict interpretation would eliminate daylight application for most of the east coast during hurricane season when public health emergency control measures may become essential. SFIREG recommends modifying the bee precaution statement by adding the clause "...except when applications are made to prevent or control a declared public health threat."

In 2000, several bee industry leaders - Gene Brandi, Lyle Johnston, Jim Bach, Dan Mayor and others were involved in labeling discussions with EPA, AAPCO, and Pesticide manufactures. EPA published a PR notice 'PR2000-5' (not to be confused with Draft PR notice 'PR2000-xx'. Pr notices define the intent of FIFRA.) the draft, 2000-xx dealt with days/hours of pesticide toxicity. Because of public outcry, mainly about State Approved Bee Protection Plan overriding label, PR2000-xx got scraped. **There has been no 'official' label change.** PR2000-5 the published notice, deals with Mandatory vs. Advisory language in the current bee cautions...

Condensed. **Mandatory statements**, which commonly use

imperative verbs such as "must" or "shall," (do, do not) either require action or prohibit the user from taking certain action... everything else is advisory; advisory language cannot contradict mandatory language.

According to the EPA Label Review Manuel Chapter 8 Environmental Hazards, there are four 'required' labeling statements for pesticides that are toxic to POLLINATING INSECTS. (Honey bees are a subset of the bigger picture).

"If a pesticide is used outdoors as a foliar application, especially to crops, and is toxic to pollinating insects, a "Bee Hazard" warning must be included in the Environmental Hazards. 40 CFR56.10(h)(2)(ii)(E). The table sets out the toxicity groupings and required label statements for honey bees."

Pollinating insects, ie. your bees, visit/forage/pollinate as a continuous, ongoing process. It is what bees do. Pollinators generally only forage when there is BLOOM present. The key word here is BLOOM. No bloom - no problem. You can apply the pesticide whenever. But if bloom is present, mitigation is in place. (EPA equates visiting and foraging, see footnote 1)

Not all insecticides have equal breakdown times; this is why EPA

has two different categories, labels with Extended Residual Toxicity Displayed, and those without. Labels without EXTENDED RESIDUAL TOXICITY DISPLAYED (ACTIVELY VISITING) labeling, indicate eight hours or less degradation time. A pesticide with this label can be applied anytime, HOWEVER if there is bloom present, it can ONLY BE APPLIED in the evening AFTER bee flight activity Applications would have to cease early enough that the pesticide could degrade BEFORE the next period of bee activity.

Next let me direct your attention to the green highlighted section, **Extended Residues Displayed**. Notice the labels are worded ALMOST the same. An insecticide with EXTENDED RESIDUES DISPLAYED, the word RESIDUES is included, and the word ACTIVELY is not used. A bee caution that has the word RESIDUES indicates an insecticide that can not be applied ANYTIME to bloom. (EPA/Jim Downing footnote 4) Bees forage or visit, it's what they do. This is FAR different than saying you can not use the insecticide. Let's be clear: THE ISSUE IS THE PRESENCE OF BLOOM.

2000 and on... Minnesota. Minnesota Department of Ag Head Pes-

HONEY BEE TOXICITY GROUPS AND CAUTIONS		
Toxicity Group	Precautionary Statement if Extended Residual Toxicity is Displayed Inserted per discussion with EPA (toxic >8 hours)	Precautionary Statement if Extended Residual Toxicity is not Displayed Inserted per discussion with EPA (toxic <8 hours)
I Product contains any active ingredient with acute LD ₅₀ of 2 micrograms/bee or less	This produce 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.	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 while bees are actively visiting the treatment area.
II Product contains any active ingredient(s) with acute LD ₅₀ of greater than 2 micrograms/bee but less than 11 micrograms/bee.	This product is toxic to bees exposed to direct treatment of residues on blooming crops or weeds. Do not apply this product if bees are visiting the treatment area.	This product is toxic to bees exposed to direct treatment. Do not apply this product while bees are actively visiting the treatment area.
III All others.	No bee caution required.	No bee caution required.

ticide Enforcement officer's, (current President of AAPCO) condensed excerpt of deposition about Sevin XLR Plus, an Extended Residual Toxicity label...

Q. What would it take to be a violation of the bee caution;

A. "a significant number of actively foraging bees and a significant number of blooming weeds"

There's two problems here - first he quotes the wrong label, and second, he adds significant number to the statement, twice. Minnesota Department of Ag and AAPCO are now trying to use the Minnesota court system to get 'legal' interpretation because they couldn't get bee cautions changed. Ongoing process.

The most recent lost ground on bee caution and environmental labeling issues was in 2004... PR 2004-0018⁵ for Mosquitoes, "...except when applications are made to prevent or control a declared public health threat." This got shot down in public comments, AGAIN. Beekeepers, environmentalists and general comments from the public overwhelmingly expressed their displeasure for the attempt⁶ BUT GUESS WHAT, it did not matter EPA has a 'public' Pesticide Program Dialogue Committee (PPDC). This committee is to be made up of interested players from the public that have a vested interest in pesticide issues. Last May I visited DC with the Executive board of the ABF. We meet with Anne Lindsay the Deputy Director of Pesticide Programs. One of the topics discussed was that the bee industry had no representation on this steering committee. Natural Resource Defense Counsel (NRDC) nominated ABF vice president Daniel Weaver to be on that committee, but EPA's response was that there were no open nominations. It seems that generally only one or two environmental groups have a seat at the PPDC meetings. The rest are chemical manufacturers or someone from EPA. With that as a background, does it surprise you that EPA brought the mosquito/bee caution labeling issue up to PPDC and that PPDC recommended


that EPA officially add "...except when applications are made to prevent or control a declared public health threat." to bee cautions? There is a move afoot in the environmental community to take EPA on with this issue. PR Notices are to help 'define' the intent of FIFRA, not circumvent it.

At the ABF meeting last January in Reno, it was unanimously voted to form a subcommittee to deal with pesticide issues. They haven't yet. We must stop pesticide insanity before it's too late. Bees are

sweet in the press right now. The pollination shortage issues have brought it about. The scientists don't know what is causing the current bee loss crisis, really Pesticides cause bees to be unhealthy. Let's not overlook this part of the puzzle. But still, the real issue is that our law enforcers won't do their job. Let's call them to account. **EC**

Jeff Anderson is a commercial beekeeper with operations in Minnesota and California. He and others are presently fighting a Minnesota court ruling on pesticide misuse on poplars.

⁵<http://docket.epa.gov/edkpub/do/EDKStaffQuickSearchResults>
⁶Docket 2004-0018



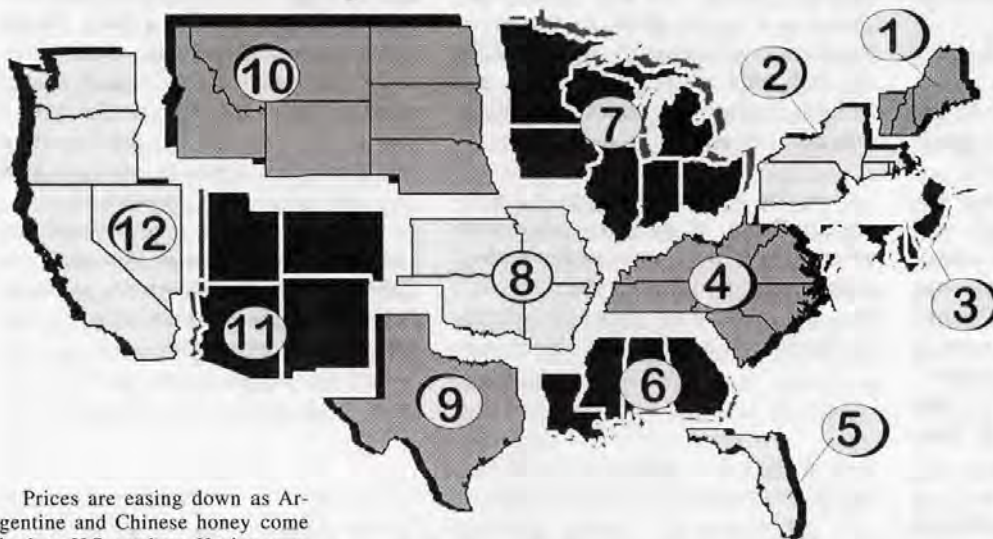
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AUGUST - REGIONAL HONEY PRICE REPORT



Prices are easing down as Argentine and Chinese honey come back to U.S. markets. Having, supposedly, cleaned up their crops and quit using unlabeled antibiotics, their products are again acceptable. Coupled with short U.S. crops from last year, foreign honey, from a packer's perspective, is attractive. The irony is that imported bees are so very expensive, and imported honey is so very cheap.

We asked reporters if they planned on raising prices this year to accommodate rising fuel and labor costs. But the competition from cheaper honey led 81% to say no, not this season. And, 28% plan on selling less honey this season, preparing rather for pollination or just running fewer bees. 42% plan on staying the same as

last year, but 30% want to increase how much honey they sell - perhaps to make up for the rest. For a good picture look at the Average Column for this month, and last month and year. It is telling.

Since Last Month:

Region 1

Bulk, pails and wholesale down, retail up.

Region 2

Bulk up, actually. Pails, wholesale and retail down.

Region 3

Bulk steady, pails down, wholesale up a bit, but retail steady to down.

Region 4

Prices essentially unchanged across the board since last month. Uncommon.

Region 5

Prices down, down, down for bulk, pails, wholesale and retail.

Region 6

Bulk and pails down, wholesale and retail unchanged.

Region 7

Bulk and pails down. Wholesale unchanged, but retail down.

Region 8

Bulk prices down but pails up. Both wholesale and retail down marginally.

Region 9

Across the board all prices edging up a tad since last month. Go Texas.

Region 10

Bulk prices up marginally, but pails, wholesale and retail heading down.

Region 11

Bulk actually up since last month. Pails down, wholesale steady and retail heading down fast.

Region 12

Everything is heading down. Bulk some, everything else fast.

Reporting Regions													History			
	1	2	3	4	5	6	7	8	9	10	11	12	Summary		Last Month	Last Yr.
													Range	Avg.		
Extracted honey sold bulk to Packers or Processors																
Wholesale Bulk																
55 gal. Light	0.92	0.92	1.00	1.35	0.80	0.88	0.82	0.92	0.92	0.88	1.25	1.10	0.80-1.35	0.98	0.99	1.21
55 gal. Amber	0.93	0.93	0.80	0.95	0.58	0.69	0.69	0.85	0.61	0.60	1.19	0.95	0.58-1.19	0.81	0.95	1.09
60# Light (retail)	97.00	101.90	87.03	96.80	82.00	60.50	94.14	110.00	123.33	87.03	135.00	95.00	60.50-135.00	97.48	107.96	103.94
60# Amber (retail)	92.00	97.30	106.29	95.35	82.00	90.50	86.00	102.50	135.00	106.29	135.00	85.00	82.00-135.00	101.10	100.50	97.60
Wholesale Case Lots																
1/2# 24's	40.77	52.80	42.96	37.53	59.04	32.50	37.92	42.96	50.40	35.76	30.00	32.32	30.00-59.04	41.25	39.32	39.37
1# 24's	58.28	56.40	67.88	55.53	48.64	56.00	60.63	70.80	67.15	61.56	74.90	63.54	48.64-74.90	61.78	61.72	58.97
2# 12's	58.39	56.10	60.01	51.87	57.78	48.00	58.27	81.00	45.30	55.92	47.00	55.64	47.00-81.00	56.27	54.50	52.46
12 oz. Plas. 24's	55.92	50.40	59.27	56.35	52.44	48.00	48.83	59.40	47.06	47.76	70.80	48.03	47.06-70.80	53.69	51.38	50.77
5# 6's	57.03	60.50	62.16	56.50	62.16	60.00	62.44	62.16	62.16	56.43	58.00	54.26	54.26-62.44	59.48	58.49	64.43
Quarts 12's	60.00	85.79	85.79	80.50	74.82	79.00	83.37	82.50	81.50	110.88	84.20	76.12	60.00-110.88	82.04	84.99	74.23
Pints 12's	40.00	55.72	55.72	56.45	42.60	48.25	57.78	49.50	45.88	60.00	55.00	48.75	40.00-60.00	51.30	51.01	44.86
Retail Honey Prices																
1/2#	2.16	1.94	2.50	2.81	1.79	2.50	2.63	2.70	3.15	2.44	2.75	2.09	1.79-3.15	2.45	2.45	2.61
12 oz. Plastic	3.08	2.60	3.75	3.39	3.06	3.25	2.83	3.57	3.33	2.90	3.36	3.00	2.60-3.75	3.17	3.25	3.10
1 lb. Glass	3.55	3.30	4.50	4.09	3.48	3.75	3.49	4.39	3.79	3.78	4.30	3.75	3.30-4.50	3.85	3.90	3.85
2 lb. Glass	6.38	6.21	8.25	5.91	6.39	6.49	6.19	8.25	5.96	6.16	5.83	6.52	5.83-8.25	6.54	6.51	6.30
Pint	4.50	6.00	6.44	5.73	5.25	4.92	6.13	5.73	5.21	6.75	5.23	4.85	4.50-6.75	5.56	5.76	5.50
Quart	8.00	8.15	11.51	8.05	7.91	8.11	8.08	8.01	8.75	11.50	8.36	8.59	7.91-11.51	8.75	8.49	8.92
5 lb. Glass	12.80	12.78	19.17	13.04	19.17	14.00	16.50	19.17	12.59	13.24	12.92	12.29	12.29-19.17	14.81	13.08	12.75
1# Cream	4.56	5.13	5.25	4.50	5.25	3.75	4.63	5.15	5.25	5.00	5.50	3.87	3.75-5.50	4.82	5.31	4.39
1# Comb	4.92	4.55	6.62	5.32	6.40	4.25	6.06	4.50	6.62	6.00	6.00	5.80	4.25-6.62	5.59	5.56	5.24
Ross Round	4.50	3.62	4.97	5.00	5.00	3.50	5.25	6.00	5.00	5.63	5.75	4.75	3.50-6.00	4.91	4.75	4.60
Wax (Light)	3.25	2.75	1.40	2.08	1.38	3.00	3.67	2.50	3.00	3.25	1.93	1.50	1.38-3.67	2.48	2.16	1.80
Wax (Dark)	2.65	2.50	1.30	2.08	1.23	3.00	3.47	2.00	2.98	2.81	1.50	1.30	1.23-3.47	2.23	1.77	1.19
Poll. Fee/Col.	50.00	34.67	40.00	38.75	38.33	48.00	45.67	50.00	30.00	47.86	70.00	40.00	30.00-70.00	44.44	48.19	41.08



Mark Winston

-30-

"Wrapping up this column is one of the last things to go, since I've enjoyed writing it as much as anything I've ever done."

The symbol -30- is a journalist's sign that a submitted article has come to its end. Its origin is unknown, but its function is to bookmark for the editor where the writer wants to finish.

This, dear readers, is my -30-. This month marks my final column for *Bee Culture*, a personal bookmark that publicly confirms what I've known for some time: my life has moved away from bees.

My attitude about transitions is complicated by two conflicting personality traits. The first is that I am hopelessly sentimental, deeply attached to friends and colleagues in a most personal way, and a serious crybaby at the slightest of events. I not only bawled my eyes out at the end of the movie *Mighty Ducks*, but cried as much and more at the end of *Mighty Ducks II*, and *Mighty Ducks III*. Pathetic, I know.

But, transitions for me also tip towards excitement about new opportunities and the rich potential from new friends and experiences. Thus, I cry shamelessly and sincerely on my way out the door, but am looking ahead by the time the door has closed behind me.

This is my 137th column for *Bee Culture*, and by the end of the next page my total output over a 12-year period will have reached about 206,000 words, equivalent to three pretty good-length books.

But I'm not stopping for lack of things to say. Bees provide limitless opportunities to think, reflect, and write about everything from nature to politics to people. I easily could continue monthly with new topics until my tottering years.

It's more that I have moved into a new work life that is deeply satisfying and stimulating, but it's intense, and something had to go.

My position at Simon Fraser University has moved administratively from the Department of Biological Sciences to the Morris J Wosk Centre for Dialogue. My new job is to direct the Undergraduate Semester in Dialogue, a program I developed focused on using dialogue to engage students with civic issues (www.sfu.ca/dialogue/undergrad). I'm also involved in Action Canada, a program that provides fellowships to 20 outstanding young Canadians each year to further develop their leadership capacity and knowledge about public policy (www.actioncanada.ca).

My shift began about five years ago, out of a sense that I had peaked as a scientist. I began to feel that my work life as I reached 50 had become "as good as it gets" in my home Biological Sciences department, and that's not where I wanted it to end.

My laboratory has contributed to basic and applied studies at a pretty good clip over the past 25 years, but I had reached the edges of my own talent. We could have continued producing the same quantity and quality of work, but nothing I could foresee in my research, teaching, or extension future would have accomplished anything of higher excellence than we had already done.

At the same time, my department was changing in two fundamental ways. First, after many years of intense and unpleasant political infighting, the Pest Management

program I had joined in 1980 was essentially gutted to make way for other priorities. Second, faculty teaching loads had shifted towards high-attendance courses, and I found myself becoming bored with lecturing to 500 students at a time.

Perhaps it was a midlife crisis. I'm not interested in cars, so buying a hot sports car was out. I'd feel foolish picking up a trophy wife, since wife number one is pretty much perfect already.

That left a career change, and fortuitously the Centre for Dialogue had just opened up at our downtown campus. The idea and practice of dialogue is intriguing, focused on consensus-building outcomes that can be considerably more effective at resolving issues than the adversarial approach that commonly characterizes societal debates.

Dialogue involves concentrated conversation and deep listening, creating environments that encourage mutual understanding between diverse perspectives. It seemed to provide a good tool to meet what I saw as the principal challenge for contemporary education, to inspire students with a sense of civic responsibility rather than just downloading organized knowledge and narrow disciplinary cultures into students' minds.

My program, now in its third year, uses dialogue-based methods to connect academic education with community-based practical issues. Each semester has a different topic, which have included environmental issues, urban design, art and community, sustainable development, and health care.

The Undergraduate Semester is populated by students from diverse departments and faculties, and we use unusual teaching approaches that include active discussion-based learning rather than lectures, exposure to and deep understanding of diverse viewpoints, a network of real-world guests, intensive mentoring, small class sizes, strong emphasis on communication skills, and student involvement in designing their own projects to have impact on community.

My bee life has been winding down as the downtown life has been gearing up. I accepted my last graduate student two years ago, have stopped applying for research fund-

Continued on Next Page

“I am hopelessly sentimental, deeply attached to friends and colleagues in a most personal way, and a serious crybaby at the slightest of events.”

ing, have been declining speaking invitations to most beekeeping meetings, and am rarely in the bee yard anymore.

Wrapping up this column is one of the last things to go, since I've enjoyed writing it as much as anything I've ever done. There is not an article I've written that hasn't provided the deep pleasure of stringing words together, and the challenge of the empty pages needing to be filled each month remains a deep thrill.

These columns have honed my ability to write, and brought me opportunities to meet beekeepers around the globe, many of whom have become close friends. And writing about bees has increased my already-deep respect for bees themselves, their keepers, and the fascinating natural world they, and we, inhabit.

I'm sitting at my desk composing this last piece during my usual early-morning writing hours. The memory that keeps recurring is of a personal milestone, an opportunity I had a number of years ago to read at a writer's festival alongside poets, mystery writers, novelists, playwrights, and philosophers. I read then from *Bee Culture* articles, and also excerpts from books and newspaper columns I've written.

It was an important moment for me, because we scientists rarely get to read our writing out loud. We live within the paradox that our greatest contribution to civic discourse is considered to be our objectivity, but it is perspective and feelings that produce the strongest writing and resonate the most with public audiences.

My own public writing accelerated when I began writing for *Bee Culture*. These columns have honed my ability to communicate and provided a springboard to writing about subjects beyond bees. Indeed, I doubt my present trajectory into dialogue would have been possible without having taken those early

tentative steps into writing about bees for *Bee Culture* readers.

These columns have connected me to the realm of emotive beliefs about the natural and physical worlds, the region of passion that scientists can, and should, bring to the issues we raise for the human condition and spirit.

This type of writing is found at the intersection of the deeply personal and the profoundly incomprehensible questions. Who are we, why are we here, what ethical boundaries define and limit our human activities, where do our responsibilities lie?

Science has much to contribute towards these big questions when unleashed from its confining modes of expression and habits of overly objective approaches.

If there's one thing I've learned from *Bee Culture* writing, it's this: good writing about science should evoke powerful responses to prag-

matic issues.

Data may tell us that the number of managed bee colonies in North America is dropping, and that the populations of wild bees are declining. The extent of these declines can be documented in professional journals and debated around the tables where public policy is forged.

A typical scientist writing about such an issue would tell us only the numbers, but the best science writing also will bring home the image of beekeepers as endangered species, and make us weep at the misfortune of bees and beekeepers alike.

There is one other thing I've learned from *Bee Culture*, and that is how much I enjoy and appreciate readers.

You have inspired me to try to write better, think harder, and care more. To you readers, my thanks for your interest, comments, and friendship over these last 12 years.

It has been an honor for me, and the deepest privilege of my career, to have had the opportunity to write with you in mind.

Farewell.

-30-

Thanks for everything, Mark.



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RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

“... the removal of drone brood combs as described in the paper clearly suppressed mite populations throughout the relatively long bee season...”

The parasitic mite *Varroa destructor* exhibits its greatest potential to reproduce on the immature stages of drone honey bees. Therefore, some mite control strategies in beekeeping have employed periodic removal of infested drone brood to reduce mite populations in colonies of bees. Drone brood removal techniques have been explored primarily in Europe, where they are often combined with other treatments or manipulations to reduce mite levels. In the U.S., drone brood removal techniques have not been utilized widely for mite control. One explanation for this may derive from the lack of published information readily adaptable to US beekeeping practices. However, a researcher from Cornell University recently reported that that drone brood removal procedures had significant effects on *Varroa destructor* levels when applied to honey bee colonies in New York State (Calderone, 2005).

The experimental design involved 41 colonies that had been treated for *V. destructor* with CheckMite+ (coumaphos) the previous fall. The colonies were maintained in three separate apiaries and, the following Spring, were reduced to a single 10-frame hive body, well-filled with bees and containing about eight combs of brood. The colonies were randomly assigned to two different groups. In both the treatment and the control

groups, an upper brood chamber was added with eight empty worker combs and two empty drone combs in frame positions two and nine. In the control colonies, drone combs were left in place throughout the season. In the treatment colonies, the drone combs were removed four times (16 June, July, August, and September) and replaced with either empty drone comb (June) or combs containing frozen dead drone brood and mites (other dates) When combs were removed from hives they were placed in a freezer until the next replacement period. Honey supers were added above a queen excluder to all colonies as needed during the season.



Dr Calderone measured or estimated parameters related to both mite levels and colony performance, including the “mite-to-bee ratio” (number of mites present per adult bee), the fall worker bee population and colony weight gain. Overall, mite-to-bee ratios measured in October were significantly different between the treatment and control groups. On average, the ratio was 0.109 in the control group (10.9 mites/100 bees) and 0.025 (2.5 mites/100 bees) for the treatment group. Interestingly, the mite-to-bee ratios were highly significant different between treatment and control groups at two of the experimental apiaries (and for the combined experiment), but were not different at the third. At the latter apiary, however, the average mite-to-bee

ratios were quite low in both the treatment and control groups (control - 4 mites/100 bees, treatment 3 mites/100bees). The reasons for such low mite levels in both treatment and control groups at this apiary were unknown and may have reflected low initial mite populations, nonetheless the results showed the value of including multiple apiaries in the study. The populations of worker honey bees were not significantly different between the two groups in the fall, indicating that multiple replacements of drone combs throughout the season did not impair worker bee production in the colonies. Finally, the average seasonal weight gains were significantly different between the two groups. Weight gain averaged 68.8 kg (151.7 lbs) in colonies where drone brood was removed, compared to 56.9 (125.4 lbs) kg in control colonies. The primary cause for the average weight gain difference measured between the two groups (26 lbs.) was likely due to differences in honey production.

The results of this study are encouraging for U.S. beekeeping for a number of reasons. First, the removal of drone brood combs described in the paper clearly suppressed mite populations throughout the relatively long bee season of upstate New York. In this case, drone brood removal was sufficient to eliminate the need for a chemical spring treatment for *Varroa destructor*. In fact, the mite levels present in some of the treated colonies in the fall were close to or below published treatment thresholds for IPM. Thus, for some of the colonies, no additional treatment would have been needed for the year. Secondly,

Continued on Next Page

the procedure, described by the author as a "simple application of the drone removal method", should be readily adaptable to management systems being used by both hobbyist and larger-scale beekeepers. The cost effectiveness of drone comb expense and labor costs for larger beekeeping operations will depend on the required changes in inspection regimes and current chemical expenses. The procedure described in the paper maintained two drone brood combs only in the top brood box, a fact that should make the periodic removal and replacement of frames relatively less labor-intensive. Of course, unless you have a gigantic home freezer, walk-in freezer or underground ice cave on your property, there may be need to purchase some sort of new or used

freezer to treat and store infested drone brood combs after they are removed. However, as with many things, there is a side benefit. In this case, the weary and hot beekeeper also would have a place to keep ice cream for consumption at the end of a hard day of apicultural activity. **BC**

Dr. W. Steve Sheppard, Thurber Chair, Dept. of Ent. WA State University, Pullman, WA 99164-6382, shepp@mail.su.edu; apis.wsu.edu.

Calderone, N.W. 2005. *Evaluation of drone brood removal for management of Varroa destructor (Acari:Varroidae) in colonies of Apis mellifera (Hymenoptera:Apidae) in the northeastern United States.* Journal of Economic Entomology 93: 645-650.

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In my October 2004 article on mite tolerance in honey bees, I mentioned the July 2004 article by Dr Tom Seeley, who is increasingly finding mite tolerant bees in Cornell University's Arnot Forest. At that time, I said, "The fact that honey bees can take care of themselves in spite of being subjected to the ravages of an introduced, exotic species, the external (outside) parasitic mite *Varroa destructor*, which has been responsible for the death of so many managed colonies, should astonish no one. This has already been seen in bee populations in the wilds of Western Russia near Vladivostok (Primorski stock) and reported in Serbia with Carniolan bees (*Apis mellifera carnica*), giving rise to "Yugo" stock. Hints of it have shown up elsewhere in Europe, which has a much longer history of mite infestation than the Americas. Finally, it is taken for granted in Brazil, where a huge beekeeping industry is beginning to flourish in spite of universal challenge by these mites."

Since then, I have found more evidence of untreated survivor stock. Yves Le Conte UMR 406 INRA/UAPV Écologie des Invertébrés, Laboratoire Biologie et Protection de l'abeille, Site Agroparc, Domaine Saint-Paul, 84914 AVIGNON Cedex 9, France; E-mail: leconte#avignon.inra.fr reports the following at the *First European Conference of Apidology*, Udine, Italy 19-23 September 2004:

"*Varroa destructor* invaded France in 1982 and spread all over the country in a few years. The feral colonies disappeared, completely destroyed by the mite. In 1994, a few feral colonies could be observed back in different places. An experiment was designed to look at the survival of those colonies, especially after the Winter, to be sure that it could not be swarms introducing the same sites. We made an investigation to evaluate the presence of feral and untreated colonies surviving the mite, and collected about 40 colonies untreated since at least two years. We confirmed the ability of bee colonies to survive to the mite, some of them being untreated since nine years"

And I reported in April 2005 on the research by Dr John Kefuss presented at the American Bee-

Malcolm T Sanford

Survivor Bees Around The World; Why I No Longer Keep Bees



"I mentioned the fact that in Iraq the ultimate survivor bees do exist, but it would take time and patience to find and propagate them."

keeping Federation Convention in Reno, Nevada in January. "Dr Kefuss has seen survival increase in colonies since 1993 in France through use of his James Bond test, 'live and let die.' This is often not rapid enough to confer *Varroa* tolerance for his taste, and so he has also implemented the 'Bond accelerated treatment' or BAT. *Varroa*-infested brood is directly introduced into colonies to provide greater challenges. In many cases 90 percent of the colonies so infested are dead in less than six months, but the ones that survive are good candidates for further breeding efforts. To maintain tolerance (resistance) Dr. Kefuss instrumentally inseminates daughters of resistant queens, and then spreads them out in different beeyards, where they are often naturally mated. In his own words, "Actually what we do is even more simple. Once we have selected breeder queens we produce virgins from them that are taken to out yards to mate. We also sometimes inseminate to produce breeder queens from our best stock. From these inseminated breeder queens we produce virgins that we mate naturally. So actually a beekeeper does not have to use insemination at all and should be able to get very good results."

Recently, my travels have taken me to the war-ravaged country of Iraq to consult with beekeepers there about rebuilding their apicultural enterprise. Because of security concerns, I did not enter Iraq proper, but spent my time in the northern part of the country, the

semi-autonomous entity known as Kurdistan.¹

This area has undergone formidable challenges due to many years of conflict. The most serious was the era when Saddam Hussein attempted to eradicate the Kurdish population through military might. The heart of this campaign was to literally destroy the many villages that dotted the landscape using any means possible, including heavy equipment and poisonous gas.

Those able to escape fled into the mountains to resume a time-honored activity as peshmerga irregulars. These fighters that literally "face death" are formidable warriors with a history going as far back as the 1920s and the fall of the Ottoman Empire. Along with human refugees, I learned that the honey bees kept in traditional basket hives were also victims of the conflict, and many of those also escaped into the nearby mountains. Like their human counterparts, therefore, peshmerga honey bees also now inhabit the Kurdish landscape in the foothills and high mountains that constitute the border between Iraq and Iran.

As I bumped over the roads of northern Iraq (Kurdistan), I realized that this provided a unique opportunity for the region to begin to develop beekeeping from scratch via "peshmerga" bees. Literally from the ashes of Kurdistan apiculture could arise a Phoenix of an industry based on untreated "survivor" honey bees, not dependent on chemicals for treatment of *Varroa* as found in much of the rest of the world. Is this

Continued on Next Page

just an academic dream or a real possibility? Only time will tell, but in the meantime I am asking my colleagues and readers to send me reflections on the following questions:

1. If you were to counsel those beginning from "scratch," in a region where the bees and people have been devastated by conflict, how much would you suggest relying on local "survivor" bees? How long could or would you recommend waiting for an industry based on such a stock to develop?
2. If you needed new genetic material quickly, how would you go about importing queens from the rest of the world with minimal risk? (Note: so far *Acarapis woodi* has not been found in Iraq and AFB and EFB are present, but apparently not at epidemic levels; small hive beetle has yet to make an appearance).
3. In rural villages with established populations of bees in traditional hives made of narrow woven baskets covered with wood ash as a wattle, would you recommend immediate transfer to Langstroth moveable-frame hives and elimination of the traditional hives as is currently proposed? If not, what would you recommend with reference to developing sustainable and appropriate beekeeping in this setting?

Ever since I sold my hives of bees in Ohio and moved to Florida in the 1980s, I have thought about reconstituting a personal apiary. Although I have kept bees in a number of settings in the past, since becoming a full-time academic this has not been the case. My reticent to reenter the activity has caused some anxious moments during my career. How could I as an apicultural consultant expect to have any credibility if I personally did not engage in the activity? I was asked the question again in Kurdistan and as usual my answer raised a few eyebrows. In response, I prepared a talk on the subject entitled: "Why I no longer keep bees."

The major reasons I no longer keep bees include the fact that it takes much more time, effort and expense that it did in the past. In addition, the keeping of bees forces

me to be something that I really have no interest in becoming, a pesticide applicator. Thus, the activity no longer appeals to me as enjoyable. In summary, there are two words that have caused me to abandon keeping honey bees: *Varroa destructor*.

It is indeed ironic that the cause of my abandoning the beekeeping craft has and continues to be other beekeepers. The indiscriminant, purposeful movement of bees and associated mites around the world by humans has caused enormous transformation. The history of the introduction of *Varroa*, and the alacrity with which beekeepers around the world clambered aboard the "pesticide treadmill" in response are tragic and well known. I was right in the thick of it as first *Acarapis woodi* (tracheal mite) came to Florida in 1984, followed by *Varroa jacobsoni* (now *Varroa destructor*) in 1987. As time went by it became clear that I simply was not going to have neither the time nor temperament to have colonies of my own.

My discussion with the Iraqis included the usual litany of pesticide use, emergence of resistance to various products, and the inevitable search for more toxic substitutes. I finished with a discussion of the recent findings with respect of tolerant and "survivor bees." As part of that I mentioned the fact that in Iraq the ultimate survivor bees do exist, but it would take time and patience to find and propagate them. One of the best ways to start would be to take another look at traditional basket hive beekeeping, which supports a larger population of bees in smaller hives that are often not managed by beekeepers at all.

This brings to mind Kirk Webster's article in the March 2005 *Bee Culture* entitled: Restoring Health. "After many dreary years," Mr. Webster begins, "when the American beekeeping community seemed unshakably committed to stop-gap mite control measures that were sure to prove self-destructive in the long run, there are now popping up around the country various success stories from beekeepers producing good crops of honey, pollen, bees and queens without the powerful hormone-disrupting

chemicals; and in some cases without any treatments at all.

He concludes: "The key point here is that now there's a viable and growing pool of unrelated, mite-resistant bee stocks and management techniques being used in the U.S. that all beekeepers can test, combine and utilize in their own locations and circumstances. All regions of the country should now be able to move toward really healthy bees and long-term solutions to our beekeeping problems. This is enormously good news."

Indeed it is and not just for North America. What really caught my eye, however, was Mr. Webster's statements concerning his three apiary "departments." He concluded that honey-producing colonies, with a large brood nest throughout the active season, were most vulnerable and easily destroyed by mites. Those devoted to nuc production, however, were able to stay healthy for a significantly longer time.

He wrote, "Every year, a portion of the overwintered nucs are (sic) retained and allowed to grow onto 20-30 combs. Then, in June and July, each one of these large brood nests is broken up into from five to 10 four-frame nucs and provided with queens from the isolated mating yard. All of these nucs spend the following winter outdoors on just four or eight combs. Once the Russian stock became available, and the new queens were mated with proven drone mothers, I was able to wean this part of the apiary off all treatments in just one generation. Losses are higher than in the 'good old days,' but the enormous productivity of the system compensates for this, and now all the new queens are tested in the real world, and forced to sink or swim independent of half-baked theories, and the bias caused by counting mites."

The "productivity" of Mr. Webster's nuc-producing colonies might mirror itself in a similar system in Iraq where the smaller traditional basket hives would be less apt to be overcome by mites than larger colonies based on the Langstroth hive. The traditional colonies are propagated by using the bees' swarming behavior to make increase. Bees in the earlier part of the season can often outstrip the mite population in growth, but are

overcome later in the year when the bee population inevitably declines and is overcome by increasing mite numbers.

It could be that in a rural village without many resources, a system based on many more traditional, smaller colonies that are not treated and encouraged to swarm and become "survivors" would be more productive in the aggregate than one founded on larger moveable-frame colonies that require treatment and more resources. Frequent reproductive and migratory swarming are also thought to be one of the reasons that Africanized honey bees in Brazil are mite tolerant and require no treatment.

Mr. Webster concludes: "My income was reduced as I invested my time and energy into the hope of a better future for my apiary. This may be an un-American stance to take...but I think it's essential if the next generation is going to enjoy keeping bees as much as we have."

To this statement, I add a resounding "amen." As I told those in Iraq, I've waited a long time to resume my beekeeping activities. **BC**

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Summer Increase

Larry Connor

Summer increase is easy for most beekeepers to make up. Here are some steps that I suggest you follow, but may later modify to fit your own management style.

A. Equipment Preparation – You may want to make up four/five frame nucleus boxes and or nine/10 frame equipment, depending upon your equipment inventory of open equipment and your perceived needs. Rollie divides 10 frame deep hive bodies with a solid board running from the bottom board to the top of the box. To it he staples a heavy plastic cloth, perhaps cut from an animal feed bag. This cloth serves as the inner cover, and allows him to inspect one nucleus in the box without disturbing the other. Other beekeepers use a solid piece of quarter inch plywood carefully cut to fit between the division board at the top of the frames. Either way, a cover is placed over both boxes. Unless you are using the Doolittle brood-above-the-excluder method described earlier, staple or nail the

A plastic burlap cloth is used to cover part of the box.



bottom board to the box, checking to make sure that the divider is bee tight. (This may be done by routing a groove for the divider to slide into).

Fill this box with a mixture of drawn combs and frames containing foundation. Rollie has had excellent success using the Pierco one-piece, beeswax coated frames for this purpose. His frames were featured in photographs used in earlier articles that appeared here in *Bee Culture*, including the November green frame (drone brood frame) from Pierco.

To reduce the chance of injuring the queen cell or the queen herself, and to make manipulation much easier, I use nine frames in 10 frame equipment. With the divided nucleus box, you must use four frames, since the divider takes too much space for five frames. Do not make up special equipment with unusual dimensions, since this reduces most resale value.

In the nine frame nucleus box, some beekeepers place a division board feeder. They fill it before they add the queen cell. Just a few Summers ago we had a dearth in the Summer and Summer feed was essential for new colony growth. Boardman or hive top feeders may also be used. A frame or two of honey taken to the apiary, or removed from a strong colony will a guaranteed a food supply. That said, nothing insures success of increase colonies as a nectar flow does. The colony will grow rapidly and be ready for more space very quickly.

B. Arriving at the apiary – With all the equipment loaded into a vehicle, the beekeeper is ready to work. If the apiary has been management so colonies are about the same strength level, you will be able to remove the same amount of brood, bees and stored honey from each unit. You will be take what the colony can spare to reduce any swarming instinct from developing, but you do not want to weaken the colony so it does not (continue to) make a honey crop.

C. Systematically working one hive at a time, remove whatever frames of brood the colony can spare, usually two or three frames per hive, perhaps two of brood and one of honey. Replace the brood frames with drawn comb so the queen will immediately lay into it. If there is a flow underway, replace the honey frame with foundation to increase your number of usable frames. Make sure to keep the brood together, and not divide it unintentionally. I place drawn comb on the outside of the brood nest, and foundation outside that. Drone brood foundation may be added if not already present.

D. Inspect each frame for a queen – If you are not using the Doolittle brood-above-an-excluder system, carefully check each frame for a queen as you remove the frame from the hive body. As you add frames to the empty box, inspect each frame AGAIN for the queen and for queen cells. If you find one queen, look for another. Between 10 to 20 percent of all Spring colonies have mother-daughter queens laying side by side.

Brood and bees from multiple hives are added to make up the box. Once filled, place the lid on the colony and screen the entrance, placing the colony in the shade if it is to be moved to another location. If it is to stay in a permanent site within the same apiary, move it to that location and restrict its entrance to reduce robbing from other colonies.

E What Strength? – As colonies are made up they



Nine frames in a 10-frame box.



Honey guarantees a food supply for hungry bees if a dearth happens

may be custom made for the strength needed for the beekeeper. If you seek full production colonies add six or more frames of brood and two or three frames of honey and pollen. If you wish to install queens or queen cells and keep them for later requeening, make up the nucleus colonies with two partial frames of brood, a frame of honey and an empty drawn comb. This will allow the queen adequate population for growth, but not become so strong as to swarm. If you want to mate the queen in a smaller unit and then move it to 10 frame equipment, add three frames of brood and one frame of honey. As you make up these colonies, make sure you move primarily sealed and emerging brood. There will be some open brood on many frames, but keep this to a minimum. Look for queen cells in development on any frames, since this may interfere with queen or cell acceptance.

F. Reduce the entrances – Robbing from other colonies is a real problem, even during a minimal nectar flow. Once robbing gets started in an apiary, it can be very destructive. This may be avoided by keeping smaller colonies' entrances reduced with a block of wood. This allows a smaller number of guard bees to protect the colony entrance. If the hives are located in the sun, consider using window or other small mesh screen as part of the entrance reducer so the bees are able to get adequate ventilation.

G. Add Cell or Queen – Once a group of bees have been queenless for several hours it is usually safe to introduce a queen cell or a queen in an introduction cage (push in cage). Many beekeepers do this at the time they make up the colony, relying on the general confusion and mixing of bees to insure queen acceptance. A cell protector that fits around a queen cell but allows the queen to emerge may be a suitable compromise for those worried about the bees destroying a "foreign" queen cell. Personally, I like to add queen cells after the nucleus or full sized colony is in its permanent location, either in the same apiary or in

another location. This will add several hours to the queenless period, and seems to reduce queen introduction problems.

As mentioned above, the use of different colored plastic cell cups will let you identify the breeder queen you used to graft from. If you move frames of brood from colonies undergoing swarming, mark the top of the frame with a colored thumb-tack. That will mark where the frame was you moved and identify the colony of origin.

H. Using virgin queens – Some queen producers emerge extra queen cells in small cages stored in incubators. These virgin queens may be successfully used in increase colonies if introduced with a candy plug at the end of the cage or the holding cylinder. In nuclei, I have used a soft marshmallow in the end of a cylindrical cage as the queen candy. I suggest you try this before using on a large scale! (Do not eat all the marshmallows on the drive to the apiary!)

I. Once sited, leave the increase colony alone so the queen is able to emerge from the cage and become established. If already mated, she should be laying in several days, and may be quickly checked in five to seven days for acceptance, as evidenced by normal egg laying in the brood cells. If you have used a virgin queen or a queen cell, allow two weeks before you check for a laying queen. This is about the fastest the queen can emerge, mature, mate, and initiate laying.

J. Followup inspections – Allow the queen to lay up the unit, and about four weeks later evaluate her performance for brood pattern, appearance of newly emerged worker bees, and the appearance of any problems. Make sure the colony continues to have adequate food reserves (one frame in five-frame nucleus and three frames in a nine/10 frame hive). Queenless colonies should be stacked on top of a strong colony and combined via the newspaper method. Watch for wax moth and hive beetle damage in queenless colonies.



Examine frames, is the queen here?



K. Over-wintering nuclei colonies – Some northern beekeepers have success over-wintering nuclei sized colonies, much like Brother Adam did in England. This may be based on a particular stock or genetic trait, and should be tested carefully. More beekeepers are able to over winter single deep hive bodies, packing the hive out with sugar syrup in the fall. In addition to food reserves, make sure such colonies are protected from the harsh winds of Winter.

L. Late Summer and Fall Nectar Flows – In many northern locations there are important nectar flows that will make the Summer increase colonies strong in stores, and perhaps produce a surplus, depending upon how you have made them up. Look for flows from purple loosestrife, sweet pepper bush (*Clethra*),

Sealed brood is best, but check for queen cells.



Japanese bamboo (*Polygonium*), goldenrod and asters. Failing that a good feeding program is essential for all colonies.

M. Evaluating colonies – When you look at new queens established in Summer increase, there should be several characteristics you should consider

- Brood pattern – Look for a compact or tight brood pattern, with few missed cells.

- Hygienic behavior – Test for hygienic behavior using the liquid nitrogen method for definite results. Lacking that, look for rapid cell clean out when infected with chalkbrood.

- Comb building/propolis – Excessive brace and burr comb, as well as excessive use of propolis is not an excuse to send a queen packing, but can interfere with your work rate.

- Temper – How defensive are these bees? Are you getting too many stings? Remove “hot” colonies from your apiary and requeen.

- Temperament – Are the bees quiet on the comb or running away as you work the hive. Quieter bees are easier to work.

- Food gathering – Are the bees adding to the stored food in the hive? If one group of colonies needs feeding while another is producing honey, that should tell you what to do.

- Pollen storage – That band of pollen between the brood and the honey on a brood frame tells you a great deal about the pollen foraging of a colony. You want colonies with good pollen foraging and reserves.

- Queen and bee color – Selecting for color is easy, just pinch the head of any queen of the wrong color for your bias. However, I try to ignore queen color and consider it meaningless. However, some beekeepers now want darker bees, since they think they are more *Varroa* tolerant. Lacking any data on this I have no opinion and can only guess. Some people say that darker worker bees work better at low temperatures and earlier or later in the day.

N. Undirected selection – When a colony dies of Winter exposure or due to mites, that selection has been undirected by the beekeeper. This has been the foundation of survivor stock I discussed earlier.

O. Going South or West – Raising almond pollination fees are attracting many beekeeper's attention. Summer increase provides a means of increasing colony numbers in a planned and managed manner, insuring survival and more importantly, strength for Spring pollination needs in almonds. If colonies are being moved south,

they may build up on a Fall flow, and then be strong enough to split *again* in the Spring. I mention these options, but the decision to become migratory is a big one and requires careful study. There are significant costs and risks in moving bees hundreds of miles for pollination our buildup. **BC**

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SURVIVORS

A plan for propagating from survivor stock.

This system is designed for beekeepers seeking to produce several hundred high quality queens at a time. By saturating the area with desirable drones and eliminating undesirable ones, you will increase of the chance mating your virgin queens to a select yet diverse population of desirable drones.

Select Breeder Queens – From all your bee colonies in your operation or bee club, select the top five to 10 colonies that show the greatest promise for survivorship and general beekeeping traits. The queens should not be sister queens if possible. You may want to test these colonies for hygienic behavior. Move these colonies to an area to become your queen yard/mating area.

Select Drone Mothers – As you select the above colonies, identify (but do not move) the next 15 to 30 colonies that have very good traits, but are not good enough to be breeders. Three weeks before you expect to raise queen, add one frame of drone comb to each of these colonies. They do not need to be in the queen yard, but should be a reasonable distance away. Two weeks before cell production, add a second drone comb, and then again one week before. At this third visit you should be able to remove sealed drone brood from each colony if the queen and bees are ready for drone production.

Drone Holding Colonies – Make up several drone holding colonies as follows: Remove a frame of largely sealed brood (with bees attached, checking for the queen) from each drone mother breeders that have produced sealed drone brood. Replace that drone comb if you did not just add one. Remove one or two frames of worker brood from this or another colony. Continue harvesting frames of sealed drone brood from each drone mother until you have three or four frames of drone brood. Taking a hive body with a bottom attached and alternate the drone brood with worker brood, adding a frame of honey and a

frame of pollen on the outside of the brood nest. The frames will appear like this

H W D W D W D W P

(H=honey, W=Worker brood, D=Drone brood, P=Pollen frame)

Continue to work all drone mother colonies until all sealed drone brood had been moved into drone holding colonies. Move these colonies to your queen yard, or within a mile of that location. Add a young virgin queen, securely locked in a queen cage. During all brood inspections, make sure you do not move a queen into the drone holding colony. Feed these bees with a division board feeder or a top feeder. Work the brood to insure that no queen cells are formed or queen enters the holder. Repeat this every week while two weeks before you are stopping queen production.

Eliminate undesirable drones – At the same time you are planning to start queen cells, visit all other colonies within mile or more radius and remove sealed drone brood or cut it out. If you get the support of neighbor beekeepers, you can control their drones as well.

Queen Cell Production – Using a transferal (grafting) or non-transfer method of queen cell production, plan cell production no sooner than the drone brood has been sealed for five days. Use a marking system to record the queen source of every queen you produce.

Queen Mating – Establish a set of mating nucleus colonies suitable for your area. add ripe queen cells within 24 hours prior to their emergence as virgin queens. Repeat this cycle for as long as you plan to mate queens.

End of Mating Season – When the last queens have been mated, work each drone holding colony, removing empty drone brood combs and adding fresh sealed worker brood. Install a laying queen (kill the old virgin), and the colony will be suitable as a production hive.

THE DEATH OF TRESPASSING BEES: WHO IS TO BLAME?

Sylvia A Ezenwa, J.D.

Part 1 of this article, in the July 2005 issue of *Bee Culture*, discussed the different legal rules developed and used by courts to determine who is to blame for pesticide-related bee deaths. And, as mentioned, in cases involving bee deaths caused by bees foraging on pesticide-treated fields, then carrying the pesticide back and infecting their hives, most courts follow the rule of the California Court of Appeal in *Lenk v. Spezia*, 95 Cal. App. 2d 296 (1949) ("the *Lenk* rule"). The *Lenk* rule refers to bees that forage on someone else's property as "trespassers," and says that a landowner has no "common law duty" (i.e., a duty imposed by past court cases) to protect trespassing bees, except that he cannot spray a pesticide recklessly, maliciously, or with a deliberate intent to injure or destroy the bees.¹ Other courts follow the rule of the Wisconsin Supreme Court in *Bennett v. Larsen Co.*, 118 Wis. 2d 681 (1984) ("the *Bennett* rule"). And just like the *Lenk* rule, the *Bennett* rule says that a landowner has no common law duty to protect bees on his property, except that he cannot intentionally or recklessly destroy the bees. But the *Bennett* rule differs from the *Lenk* rule in that it does not refer to bees as "trespassers," because, unlike other trespassers, a landowner cannot prevent bees from entering and foraging on his property.²

Earlier this year, when the Minnesota Supreme Court decided the case of *Jeffrey Anderson, et al., v. State of Minnesota, Department of Natural Resources, et al.*, 693 N.W.2d 181 (Minn. 2005) ("the *Anderson* case"), it chose not to follow either the *Lenk* or *Bennett* rules, but developed its own. What is the Minnesota rule? And will it affect the way other states decide cases involving the death of trespassing bees in the future? Those are the topics discussed this time.

How Did the *Anderson* Case Begin?

In 1998, Jeffrey Anderson, James Whitlock, and Steven Ellis (the beekeepers) suffered damage or loss of numerous honey bee colonies as a result of bees foraging on neighboring hybrid poplar groves that had been sprayed with the pesticide *Sevin XLR Plus* to kill cottonwood leaf beetles. The groves were managed or owned by the State of Minnesota, Department of Natural Resources (DNR) and International Paper Company (IP), and the spraying was done by commercial pesticide applicators.³ The beekeepers sued the DNR and IP, claiming that both were guilty of negligence for spraying *Sevin* in a way that created an unreasonable risk of harm to their hives. But the trial court dismissed the beekeepers' negligence claim. And the court of appeals followed the *Bennett* rule and upheld the dismissal.⁴ Disappointed, the beekeepers took their case to the Minnesota Supreme Court, hoping for a different result.

What is the Minnesota Rule?

In Minnesota, if a landowner does not know that livestock trespass on his property, then he is not responsible if the animals are injured, unless he intentionally or recklessly injures them. But if a landowner does know that livestock trespass on his property, then he may be held responsible if the animals are injured, if their injuries are caused by his negligence or failure to

use reasonable care. In other words, a landowner owes a duty of reasonable care to trespassing livestock once he knows or is on notice of both the animals' presence and of any impending danger to the animals.⁵

But are bees "trespassing livestock"? According to the Minnesota Supreme Court, it does not matter. Because whether bees are classified as trespassers or not, a landowner's duty to them is the same: A landowner has a duty to use reasonable care to avoid injuring bees if he knows (has actual knowledge) or should know (has constructive knowledge) that: (1) bees forage on his property; and (2) the bees are in danger from the pesticide being used.⁶ This is the Minnesota rule. And if a landowner knows both of these things, yet still does not use reasonable care when spraying a pesticide, he may be found guilty of negligence, and may have to compensate a beekeeper for his dead bees.

Suppose a landowner knows that bees forage on his property and that a bee-sensitive pesticide is being used, but does not spray the pesticide himself. Instead, he hires a commercial pesticide applicator as an independent contractor to do the spraying. Can the landowner still be found guilty of negligence? And will he still have to pay for the dead bees? The answer is maybe, but only if the landowner: (1) retains controls over the details of the spraying operation (e.g., the time of day the pesticide is sprayed and the rate of application); and (2) fails to reasonably or carefully supervise the applicator (e.g., by failing to tell the applicator about the presence of bees on the property and their sensitivity to the pesticide being used).⁷

Therefore, under the Minnesota rule, a landowner is guilty of negligence if: (1) he owed your bees a duty of reasonable care; (2) he breached or violated that duty; (3) your colonies were damaged and bees died; and (4) his breach of duty caused the bees' deaths.⁸ All four are discussed in detail below.

(1) Duty of Care

To prove that a landowner or applicator owed your bees a duty of reasonable care, you must produce evidence that the landowner or applicator had actual or constructive knowledge that: (1) your bees foraged on his property; and (2) the bees were in danger of being killed by the pesticide being used, or of carrying the pesticide back and contaminating their hives. The best

Continued on Next Page

evidence is the minutes (or a video or audio recording) of a community beekeepers' meeting, attended by the landowner or applicator, at which apiary and foraging locations are discussed; or a written acknowledgment from a landowner or applicator that you personally told him about your bees.

Written evidence is best, because it is much harder for your opponent to contradict. So you should always provide written notice to the owners of land where your bees forage. And keep copies of all correspondence, along with records of when, and to which landowners, the notices were sent. Unfortunately, simply registering your apiaries with your state's department of agriculture is not enough to put a landowner on notice about your bees, even though the registry information may be readily available over the Internet or by phone. The Minnesota Supreme Court makes this point by saying: "[W]e do not view such ready access to [apiary registry] information as obligating land possessors to investigate for the presence of honey bees. Some states have pesticide notification programs under which beekeepers provide written notice of their hives to surrounding commercial agriculture operations or to authorities charged with granting pesticide-permit applications. It seems more workable and practical that beekeepers who want protection from pesticide application provide notice to those who possess land where the beekeepers know or should know their bees will forage."⁹

(2) Breach of Duty

To prove that a landowner or applicator breached his duty of reasonable care, you must produce evidence that the spraying was done in an unreasonable or careless manner. The best evidence is detailed records of: (1) the date when you first notified a landowner or applicator about your bees; (2) the date when a landowner or applicator implemented a new policy regarding the use of a bee-sensitive pesticide (e.g., spraying during non-foraging periods, or giving beekeepers 24 hours advance warning before spraying); and (3) the date when any such policy was violated (e.g., advance warning was not given), resulting in the death of your bees.

(3) Damage

To prove that your bees died, you must produce

visual evidence of the extent of the damage to your colonies. The best evidence is: (1) color photographs and video of the dead and dying bees in your apiary; (2) a detailed description of the conditions of the dead and dying bees (e.g., restlessness; inability to fly, except for short distances; trembling; aimless crawling and tumbling; paralysis of the bees' legs; unhooked rear wings that are held at abnormal angles¹⁰); and (3) an authoritative beekeeping book that lists the common symptoms of pesticide contamination. The book will confirm for a court, unfamiliar with bee biology, that the symptoms of the bees in your photographs are consistent with pesticide poisoning.

(4) Causation

To prove that a landowner or applicator's unreasonable or careless use of a bee-sensitive pesticide caused the death of your bees, you must produce evidence of: (1) the name of the pesticide suspected to have caused the deaths; (2) the date and time the pesticide was sprayed; (3) the proximity of the sprayed crops to your apiary (presumably, within foraging range); (4) the residual toxicity of the pesticide; (5) a copy of the pesticide label, including the bee caution; and (6) test results from a laboratory analysis of the dead bees, confirming that the suspected pesticide poisoned them.

What is *Negligence Per Se*?

In the trial court, the beekeepers also claimed that the DNR and IP were guilty of *negligence per se* for not following the directions on the *Sevin* label, because failure to follow label directions is a violation of the Minnesota Pesticide Control Act.¹¹ A person is guilty of *negligence per se* when he violates a statute.¹² For an ordinary negligence claim, a landowner or applicator has a common law duty to use reasonable care when applying pesticides if he knows (or should know) that bees are foraging on his property and that they are in danger from a bee-sensitive pesticide. However, for a *negligence per se* claim, the duty is not a common law duty, but a "statutory duty" (i.e., a duty imposed by a statute or administrative regulation). For example, suppose your state's pesticide use statute reads: "It is violation of this statute to use a pesticide in a manner that is contrary to label directions." Then the duty of care imposed by that statute on a pesticide user is to follow the label direc-



tions. And if the pesticide user does not follow the label directions, he may be found guilty of *negligence per se*. In order to prove *negligence per se*, a beekeeper must prove not only that the pesticide use statute was violated, but also that the purpose of the statute includes protecting beekeepers and preventing the killing of bees.¹³

Let's say your bees died as a result of foraging on neighboring property that was sprayed with a bee-sensitive pesticide. The bee caution on the pesticide label reads: "Do not apply this product or allow it to drift to blooming crops or weeds if bees are foraging in the treatment area." If you decide to sue the landowner or applicator and claim that he is guilty of *negligence per se* for not following the label directions, you must produce the following evidence: (1) a provision or clause from your state's pesticide use statute that prohibits the use of any pesticide in a manner inconsistent with its label; (2) the name of the pesticide suspected to have killed your bees; (3) a copy of the bee caution on the pesticide label; (4) testimony from an entomologist or apiarist explaining how to determine foraging and non-foraging periods, and concluding that the pesticide was applied during a foraging period; (5) color photographs or video showing the dead and dying bees in your apiary; and (6) test results from a laboratory analysis of the dead bees confirming that it was the suspected pesticide that caused their deaths.

Unfortunately for beekeepers, courts usually presume that the decisions made by government agencies, such as your state's department of agriculture or the Environmental Protection Agency, are correct. So courts will generally defer to the opinion of a government agency's expert in the particular field in which he has received technical training, education, and experience. The only time that a court might reject or dispute the opinion of a government agency's expert is when it is unlawful, arbitrary, or not supported by enough evidence. Or maybe, when the opinion is given solely to be used as evidence in an impending lawsuit.¹⁴ What this means is that, if your entomologist or apiarist's explanation of the word "foraging" on a pesticide label differs from the explanation given by a government agency's expert, the court will most likely accept the government's explanation.

What Does the Future Hold?

In March 2005, the Minnesota Supreme Court ruled that it was improper for the trial court and court of appeals to dismiss the beekeepers' negligence and *negligence per se* claims without a trial. So the case was sent back to the trial court, where it is currently awaiting a trial. When the trial is eventually held, it will be up to the judge or jury to answer the pivotal question posed by the Minnesota rule, which is: *Did the DNR and IP know (or should they have known) that the beekeepers' honey bees foraged in the poplar groves and that the bees were in danger from the use of the pesticide Sevin?* If yes, then the DNR and IP had a duty to use reasonable care when spraying. If no, then they had no duty, except to not intentionally or recklessly injure or destroy the bees. How this question is answered depends on the amount of evidence produced by the beekeepers. Keep in mind that the trial court dismissed the

case the first time because it did not think the beekeepers had produced enough evidence to prove that the DNR and IP were negligent.

As for future lawsuits between beekeepers and landowners or applicators, the *Anderson* case from Minnesota now joins the *Lenk* case from California and the *Bennett* case from Wisconsin as one of the decisions that courts in other states will look to for guidance when deciding bee foraging cases. Courts in other states may, but are not required to, follow the rules of any of the three cases. No doubt, the Minnesota rule is much friendlier to beekeepers than either the *Lenk* or *Bennett* rules, because it at least gives beekeepers a chance at being compensated for the death of trespassing bees, provided that they can prove that a landowner knew (or should have known) of the bees' presence and of the danger they were in from pesticides.

Conclusion

If there is a common theme running through all the bee foraging cases, it is that courts are very reluctant to hold landowners and applicators responsible for the death of trespassing bees. So your best bet is to avoid litigation. How? With *effective and constant communication*. Tell neighboring landowners that you have apiaries nearby. Tell them when and where your bees forage. Ask them to give you 24 hours advance warning before spraying. Discuss the precautions you both can take to keep your bees safe. Remember, an ounce of prevention is worth a pound of cure. And when the cure is as lengthy and costly as litigation, prevention may be worth even more. **BC**

Notes

1. *Lenk v. Spezia*, 95 Cal. App. 2d 296, 302-303 (1949).
2. *Bennett v. Larsen Co.*, 118 Wis. 2d 681, 691 n.3 (1984).
3. *Jeffrey Anderson, et al., v. State of Minnesota, Department of Natural Resources, et al.*, 674 N.W.2d 748, 751-752 (Minn. App. 2004).
4. *Id.* at 756-758.
5. *Jeffrey Anderson, et al., v. State of Minnesota, Department of Natural Resources, et al.*, 693 N.W.2d 181, 187 (Minn. 2005).
6. *Id.* at 187.
7. *See Id.* at 189.
8. *See Id.* at 186 n.1.
9. *Id.* at 187 n.3 (citation omitted).
10. *See Murray Loring, Bees and the Law* 55 (1981).
11. *Jeffrey Anderson, et al., v. State of Minnesota, Department of Natural Resources, et al.*, 693 N.W.2d 181, 185 (Minn. 2005).
12. *Id.* at 189.
13. *Id.* at 190.
14. *Id.* at 191; *Jeffrey Anderson, et al., v. State of Minnesota, Department of Natural Resources, et al.*, 674 N.W.2d 748, 755 (Minn. App. 2004).

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DISCLAIMER: The information in this article is not intended to constitute legal advice. Please consult an attorney regarding your specific situation.



Late Season Requeening

John Jacob

Somewhere in all those boxes is the queen. But it's easier than the needle and haystack.

The subject of when and how to requeen hives is a time-honored subject that definitely warrants some exploration. A well-mated, young queen is essential to the fecundity and success of any colony. As a queen ages her diploid egg-laying rate will decrease and she will produce fewer workers. The quality of a particular queen's mating will determine her lifetime supply of semen; which will eventually run low and she will begin to lay more drone eggs. Maintaining healthy young queens in your colonies will increase yields and productivity because they produce more workers faster, and can improve the overall genetics of the colony. These are some of the more common reasons one would requeen a colony, which brings us to the subject at hand; when is the best time to undertake this operation, and how would one go about it?

The short answer to "When is the best time to requeen a colony?" is anytime they need it, especially if there are problems with brood pattern, disease, or overall decline. That scenario aside there are many arguments for doing the bulk of your requeening later in the season as the honey flows begin to subside, and before the old queen slips into a state of decline. This puts regular requeening at the heart of your essential annual management plans.

In many areas brood rearing begins to taper off in the late Summer and the *Varroa* mite to bee ratio begins to become very stressful on a colony. This is usually when symptoms of PMS (parasitic mite syndrome) become very apparent because there are more mites to go around and fewer bees, especially drones for them to parasitize. Requeening at this juncture will do two powerful things for your colony. First, a disruption in brood production interferes with the reproductive cycle of the *Varroa* mites naturally. This break happens naturally through the process of requeening. Second, once

the new queen is established, you will have a queen at the helm that will lay more eggs faster than an old tired queen. This will do wonders towards successful overwintering. It has been my experience that colonies headed by vital young queens produce better Winter clusters and build up much faster and earlier in the Spring.

There are several other arguments for requeening in the Fall. One has to do with the quality of a queen's mating. Queens mated during the warm months of Summer when the "livin's easy" generally have better mating weather and therefore more access to a very abundant supply of drones. Drones can often be in short supply very early in the season due to weather conditions and natural shortages that occur due to pollen supply. The more drones a queen mates with, the greater a particular queen's store of semen will be. More semen will yield more potential workers that queen can produce.

Summer mated queens often have better potential to store a larger volume, or at least enough of semen in their spermatheca to perform adequately. A thoroughly mated queen will also increase the profitability and survivability of the colony by increasing the genetic variability of the workers and maximizing brood viability.

Another notion to consider is; "what happens when things go awry?" Bad things can happen to good beekeepers and sometimes the new queens will not be accepted or may be of low quality. Whatever the case, if this scenario occurs during the spring buildup a colony can be set back just when it needs to increase its population the most in order to garner a bountiful harvest. Fall or late season requeening could actually

Separate the boxes and let the guards and foragers return to the original stand, reducing the bees to look through, and the number that will get upset. And get a stool.





This is the set up for looking later. The foragers and guards go to the honey supers, and nurse bees and the queen will stay in the brood boxes. The queen is in the quiet box.



If you provide an empty spot, the queen will be on one, or the other side.

be viewed as very early requeening because it is so far out ahead of the next nectar flow. This perspective gives you more time to make management adjustments if things do not go as smoothly as they should. Further, heading the colony going into the Winter season with a young healthy queen can significantly reduce Winter losses and make it easier to take advantage of early Spring pollination opportunities. This is the case with almonds, where you need strong bees in early February. Once again, one of the main reasons a young queen is better suited to the task of over wintering a colony is the fact that she has the capacity to lay more fertilized eggs, and if received from a reputable supplier she will be very healthy and disease free.

If you have decided to undertake the task off Fall requeening you need to know how to go about the job. There are nearly as many different requeening techniques as there are beekeepers, and Fall requeening presents a few challenges with its opportunities. First, robbing can be a pernicious problem this time of year, so you must be extremely careful not to encourage it in the first place. Preventing robbing is important for the health of the bees, making a pleasant work environment, and neighborhood harmony. One particular

Or, simply leave room between frames to keep her isolated.



technique that I find very helpful with the requeening process and preventing robbing is to have some supplemental feeding going on so there are fewer idle field bees to meddle in your affairs. Generally requeening is much easier during a nectar flow, real or simulated.

Another major challenge of Fall requeening is finding the old queen in a colony that still may have a very large population. My favorite way to accomplish this is to get in touch with my inner bee and perceive exactly where the queen is within the nest architecture, open the colony up, and know the exact frame she is on. Next, pull the frame without damaging her or rolling bees. Realistically, this seldom happens, and may never happen for you, so some practical alternative procedures are in order

Since conditions vary from situation to situation here are some very general guidelines that can be extremely helpful in most queen finding situations. The first thing I like to do is to reduce the population of bees that I have to look through to find her. Depending on the time and equipment available there are several tactics that can be employed to accomplish this. The easiest way to do this is to install a queen excluder between the hive boxes and come back in four days; enough time for all the eggs in the queenless portion to hatch. Then, simply spilt the hive into its constituents and identify the box with the eggs. At this point return the queenless portion to the original hive stand to receive incoming field bees. The volume of bees in the queen's box can be further reduced by letting it sit off to the side of the rest of the colony for a short period of time so that even more of the field and guard bees that are present have time to fly back to their original hive location.

If you have supers on a two box brood nest and no excluders available there are still some excellent options, assuming you know the queen is not in the honey super. The first step is to break the colony in to its constituents, and place the honey super on the original location to catch the field bees. The next step is to go do something else for a while, like start the procedure on another colony. The goal here is to let the field bees return to the original location, thus depopulating

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Gotcha!



Now that you've got her marked she can go back to work and she'll be easier to find.

the boxes you have to look through and removing the testiest bees. Now the "haystack" is substantially smaller, thus increasing ones odds of finding the "needle." I have also found that if enough time lapses while you work through the other colonies your ears will be handy in deciding where to begin looking for the queen. Choose the quieter of the two boxes set aside to look through first. The box with the queen will often be the quieter unit. Regardless of which box you start with, the job will be easier with the field bees out of the way. Some other pointers to remember when searching for a queen are to get comfortable so you do not have to work bent over in a cramped position. Ergonomics is everything when searching for a queen, I usually prefer to kneel or sit on a small stool.

Another helpful tip is to use a minimum of smoke. The queen will be much easier to find when she is not running from you. I generally prefer to pull an outside honey frame so I can separate the brood frames a bit more to make it difficult for her to move from frame to frame while I am searching. When you pull a frame is for its initial examination, do not spend too much time pouring over every square inch. Good lighting is essential to spotting the queen, so keep the frame you are examining well illuminated by standing with your back to the sun when possible. Once your eyes have adjusted to the search image, a quick scan should be sufficient.

With practice the queen will usually be found on the first brisk tour of the nest. I also generally like to examine the two center frames first so that the brood nest is split down the middle when they are set aside. If the queen begins to run from you when things are arranged this way, she will be isolated on three or four frames to the right or left of the center frame.

As you pull frames for examination, a quick glance at the neighboring frame will often yield a queen sighting. Do not despair if you do not find her on your first run through, sometimes even the best queen hunters get stymied and have to come back again later.

Once the old queen is found she can be removed from the colony and relocated or disposed of, or in some cases caged and marked. Next let the bees remain queenless for a period of time in order to help make

them receptive to the new queen. I usually like to wait 12 to 24 hours for introduction.

The other tried and true requeening technique that I frequently employ is to introduce the queen to a small nuc that has been stocked with young bees. This means a frame of emerging bees and perhaps some nurse bees from open brood, plus a frame of food. Young bees have not had a chance to imprint on the old queen and will be more receptive to the new queen. Once the new queen begins to lay eggs, dispatch the old queen from the colony to be requeened. If you plan to directly introduce the queen to the established colony in the shipping cage be sure to watch for workers attempting to ball the queen when she still is in the cage. This will indicate that they are not ready to accept a new queen. Your queen supplier will usually offer some guidelines for introducing the queen depending on the type of shipping cage being used.

With all the daunting challenges facing a colony in this era of apiculture and time of year, a robust, healthy young queen is one of the most important ingredients in the recipe for success. Give your colonies a super boost when they need it the most and call your favorite queen supplier and order some late season queens.

John Jacob is a commercial beekeeper from Rogue River, Oregon.

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M O U S E



underneath siding and other gaps as bridges into honey houses and hive equipment storage sheds. With live colonies they wait until guard bees retreat from the hive entrance and then slip into a beehive. Most mice get in at ground level or two or three feet up from the ground. They can slip through holes with diameters as tiny as three pencils put together.

Although there are a number of poisons, the best way to prevent a mouse infestation is to exclude mice from the house or structures we use to store bee equipment. Prevent these diminutive rodents from getting inside by filling all holes around the foundation with a gnaw-resistant compound or insulation. Reduce entrances to keep them out of hives.

Once mice manage to get into a hive or structure, they make nests of anything they can find – from cotton to garden debris. They initially mark a territory to warn potential rivals of their claim. Then they exit and enter numerous times carrying the nesting material to build a suitable nest. And once they have a nest, reproduction begins. Although mice probably don't give birth to multiple generations while living in a hive or honey house, we shouldn't be surprised to see one or two young for each adult. That will be more mice for birds and other predators to eat during the Spring but also a potential for reinfestation the next season.

One sign that you have a mouse infestation are brown droppings the size and shape of a grain of rice. These may be found on the floor, in food such as stored sugar, in cabinets or in piles of stored equipment. In looking at hive entrances it might be difficult to tell if a mouse has moved in without opening and looking for their signs but gnawing damage to wooden entrance reducers, bottom boards and back corner openings might give them away if you know how to look.

Mouse control consists of taking away their food, shelter and water, just as in all other pests. Seal all potential mouse food in gnaw proof containers, espe-



Dewey Caron

There are several species of mice that can cause problems, but the problems are all the same.

Each Fall, unwelcome beehive visitors always seem to pop up at the most inopportune times. These 'guests' overstay their welcome into the Spring as they eat our overwintering food, make a mess of the honey house and disrupt the beehive. Nope, these hive visitors aren't the topic of every beekeeping conversation about overwintering these days – mites. Rather, these pesky guests are more irritating than dangerous, but can be just as difficult to get rid of – and as deadly – we're speaking of mice here!

Crisp Fall weather and decreasing daylength signal both bees and field mice to find shelter from the cold. Although neither mice nor bees are thinking critters, they begin to put on weight and store more fat body reserves because their hormones tell them it is time to seek refuge for the Winter as the day length shortens.

Mice will seek unlikely locations and routes to get inside while it is still relatively warm in the Fall. They use power lines, gas lines, utility entrances and spaces

A space for a nest is made by chewing large holes in several frames of comb, destroying the comb, contaminating the floor of the brood box with droppings and urine, and consuming stores meant for your bees. Several frames may be ruined by a single mouse.



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The bees will 'repair' the damage, but it will be extra work, extra wax, extra honey, and ultimately, extra drones.

cially dry goods. Keep the "kitchen" clean, and sweep up all food debris from the floor as best you can. Remember they can subsist on honey so keep it tightly closed – storage of full frames for Spring feeding should be done in a freezer or a container you can securely close – they readily gnaw through garbage bags.

Just as mice create health code violations in restaurants, they also can cause health-related issues in the honey house. If diseased mice feed on the same food as you do, they can transmit disease. Mice can carry a number of diseases in their droppings, in urine and on their fur, which can contaminate the food you eat. If you live in a state where honey houses are subject to health Department inspection, they will be looking for evidence of mice infestations and/or their droppings.

The moment you see a mouse in a hive, the most proactive measure is to force it out the way it came in. That way, the mouse is out of the hive and you can see how it got in. If you put on entrance reducers too late in the season, like we all too frequently do, and close up the usual entryway, the mouse will be trapped but it will seek a way to make another entrance. It will then potentially do more damage. So look first, shoo them away and then prevent reentry. If mice have been in a hive or honey house for a while and have a large investment in a nest or are rearing babies, more drastic measures are needed.

Baits and traps are the two most common ways to rid storage structures of mice. Baits are chemical compounds that trigger internal bleeding in mice, causing them to get sick, stop eating and eventually die. Unfortunately, the dead mouse's body will attract cockroaches, flies and other insects, and may end up creating an additional pest infestation if used in the honey house. Mice that die between walls, behind stacks of equipment or in otherwise inaccessible areas may re-

sult in a decomposing odor, too.

Mouse traps are designed to lure and catch individual mice. There are two types of traps: those that catch the live mouse to be released elsewhere, and traps that kill the mouse. Traps work best when put in places where mice regularly travel, such as along walls and beneath structures. You've got to think like a mouse – they prefer to keep their whiskers against the walls as they run and they do not like open spaces. They don't wander long distances either and you have to go where they are to be successful. As a rule of thumb, successful trapping means deployment of several traps in several likely locations – not just one or two.

The advantage to traps over bait is that you have a dead body to remove. It is important to continue the trapping and removal program as long as there is continuing evidence of mice inside. If the problem turns out to be larger than expected, a combination of the two techniques might be necessary. Although you might prefer to use a live trap, release of captured mice and release away from their home range usually means death in a short time. Live traps are "pabulum for the mind" – we think we are being humane but the result is the same – a dead mouse.

If you've had mice before in your apiary, in equipment storage areas or the honey house, you're much more likely to have mice again. Mice, like bees, recognize odors of their own kind and are likely to return where there have been mice before. It would be well to begin trapping earlier and to intensify your exclusion efforts to keep a lid on a mouse "problem" You can't eliminate all of them but you can keep damage and numbers to a minimum. **EC**

Dewey Caron is a professor at the University of Delaware. He has authored several beekeeping books and is a frequent contributor to Bee Culture.

REED BOOTH

KILLER BEE GUY



William Childress

In Jalisco, Mexico, in 1990, two American adventurers were flying low in a 1958 Piper Tri-Pacer, a rugged and reliable plane in spite of its being over 30 years old.

"That looks like the landing strip," pilot Electric Dave Harvan said to navigator Reed Booth.

Booth nodded. "According to the map, it is."

What he didn't know was that the map was an old one. Harvan throttled back to a slow glide, and the grassy airstrip flowed beneath them. He eased the yoke back for a gentle three-point landing.

Crunncchhh!

The Piper jerked crazily as it struck ground much too rough to be a runway. The fairings flew off the wheel struts as Harvan, gripping the wheel, yelled, "It's plowed! Some stupid ass plowed the landing strip!"

The Tri-Pacer slammed to a stop, throwing both men forward against their seat belts as its tail rose and the plane stood on its nose. Had anyone been watching the tableau, they would have seen it rise with almost delicate precision, wheels trapped by grass and earth, then balance like some strange sculpture. Booth was sure the propeller was ruined, but thanks to Electric Dave's quickness in cutting the ignition, it would prove to be operable.

The two climbed out, jockeyed the plane down from its vertical position, and examined the field. Under the

grass it was furrowed and rough. The old airstrip, replaced by a new one miles away, had been sold to a farmer who cross-plowed it and left it fallow. Electric Dave walked back, picked up the ripped-off fairings, and put them in the plane.

"We," he said, "are damned lucky."

Later, in the living room of his rustic stone house in Bisbee Canyon, Reed Booth said, "Neither of us got a scratch. But we had to empty the plane of everything – including me – to lighten it enough so it could take off. Dave, who is one hell of a pilot, flew that Piper out in impossible circumstances, threading it between two trees by flipping it on its side. Then I went out to the highway and caught a ride with a Mexican in a VW bus."

He chuckled.

"I told him what had happened, and he pulled out a bottle of tequila and said, 'Here – I think you need this!'"

Electric Dave now owns the Electric Brewing Company LLC in Bisbee, Arizona. A mechanical genius, he designed and built the brewery himself, right down to welding its stainless steel pipes. His beer is sold in most of Bisbee's bars. He and his former co-pilot are still fast friends.

Reed Booth has come a long way since that crash landing in Jalisco 16 years ago. Today, he's famous as "The Killer Bee Guy," thanks to a lot of TV exposure,

Reed and his assistant Frank Bennett, taking apart a building to remove Killer bees' nest.





14 nests were in this space – a record, and two days work.



numerous stories about his exploits in newspapers and national magazines, a dynamic and profitable web site (www.killerbeeguy.com), on every product he sells) and the personality and drive of a born marketer.

Booth is candid about the marketable publicity that stems from being the only killer bee remover within 100 miles and misses no chance to utilize it. But, he says, publicity or notoriety are only good if they produce sales and make money. He even introduces himself as, “Reed Booth, the Killer Bee Guy,” and keeps a straight face doing it.

“I lost a good friend, Paul Dwyer, to cancer,” he told me. “Not long before he died, he said, ‘Reed, it’s all right to have no money when your young, but damn it, don’t let it happen when you’re old!’”

“Best advice I ever got,” Booth said. “My goal now is to do everything I can to become rich.”

That goal will be advanced by his being an award winning entrepreneur and food medalist as the result of inventing a line of products that are well-known and widely distributed. He’s the CEO of *Killer Bee Honey, LLC* and his compact stainless steel production facility is operated by long-time partner Fabrianne Fox in a sparkling but unpretentious facility near their home.

Fabrianne, as artist born in Bisbee, is the former high school cheerleader who designed the eye catching company logo and mailing labels. Paula Cash, lab supervisor, makes the product according to Booth’s formulas, labels it, and ships it. Killer Bee Honey, LLC recently added its ninth employee, and the Wisconsin bee expert who once lived in his car now earns an annual six figure income.

But Booth’s real love (as well as some hefty earnings) is still the removal of Africanized killer bees. “It’s a rush,” he said and he’s right. I saw him get stung on the thumb and rush to put it under cold water

Booth’s Killer Bee brand is sold both locally and nationally, and to a lesser extent, outside the U.S. His best seller is a line of Honey Butters and Honey Mustards, crafted by Reed, an excellent cook. Gourmet priced at \$20 per gift package, they are very popular with the tourists that flock to Bisbee.

“We can’t keep ‘em on the shelves,” says Booth’s long-time shop stewards Jim and Francine, who have operated the tiny Main Street shop in Bisbee for six years.

Booth recently hired another shop assistant, plus a young giant named Frank Bennett, trained by Booth,

who helps with bee removal. Not long ago, Booth and Bennett, removing a hive under a trailer, ran into some bad luck. Booth was stung eight times, and Bennett 16 times – right through their suits. Booth cursed and endured it, but it was Bennett’s first time, and he took off for the tall timber – returning rather sheepishly when the pain lessened.

How did a green-eyed, brown haired, not even close to six foot “bee-meister” from Wisconsin end up in Bisbee, Arizona – a copper kingdom from 1881 to 1975? And how did he become “Arizona’s most famous killer bee expert”, judging from the press?

“Those labels aren’t all by me,” Booth says firmly. “I’m called all sorts of things. Writers want stories, so they come up with nicknames based on events involving me and Africanized bees. There’s a kind of romance that surrounds something alien and dangerous. Who wants to read dull stuff? And I’d be foolish not to take advantage of free publicity. Every beekeeper should, because advertising, no matter how it comes, is valuable and it’s expensive to buy. And how else can your products be known?”

“I felt that way long before I got into the honey business. *Modesty in business is counterproductive*. Blow your own bugle or it won’t get blown. How you blow it is up to you, but to compete, you have to make some noise.”

He pauses reflectively. “At some point Americans were taught that having an ego, the driving force of success, is bad. But it’s only bad if someone is arrogant. ‘The meek shall inherit the Earth,’ won’t influence someone like Donald Trump. Try that with him, and he’ll have you for breakfast. Unfortunately, bee keepers in general aren’t noted for being strong businessmen. I’ve found them to be rather solitary, even when they don’t have to be. Most of them are also older men. The honey business needs to start attracting younger members, or the shortage of honey, which is already severe, will get worse.”

Reed says he discovered boldness in business

when he was a starving artist. "I was gonna make my living with arts and crafts, on the flea market circuit. But I was dyslexic in that regard - I had it backwards. Don't try to make money as an artist, because the odds are millions to one against you. First, make money, and then you can do whatever you want, art or anything else. And if you become famous in another field, people will buy your art if you can't even draw! Boldness doesn't mean being arrogant, it just means applying maximum energy to what you want to accomplish."

Born January 9th, 1959 in Eau Claire, Wisconsin, Booth is the oldest of three children. When he was still a child, his brother and mother died. His sister, Sandra, still lives in Wisconsin. His dad, 44 when Reed was born, recently celebrated his 90th birthday, in Bisbee.

Booth remembers always wanting to investigate the world and try new challenges. Taking chances was part of his life style.

"When I was 17," he said, "I acquired two lion cubs; Moses and Baby, and I raised them on the turkey farm where I lived. I hand raised them and they were just like big kittens. The vet said he's never seen tamer, healthier lions. I fed them turkeys, and the farmers would give me dead cattle and I'd chain-saw them into pieces for the cubs."

But the lure of adventure was too much. At 20, he sold the cubs to a zoo and left Wisconsin. For the next four years, he lived in a Chevy Suburban, traveling all over the U.S. and Mexico.

"Campground living wasn't all that bad," he said. "I usually had a companion along and my goal was to experience life and have fun, and I succeeded. In retrospect, I realize I was just growing up, but differently from most folks."

It was during this time that Booth became known along the Arizona-Mexico border as "El Hombre de los Milagros," The Miracle Man.

"On one of my Mexican trips, I became friends with a priest," he explained. "Mexican Catholics love charms, relics and so forth, and for their various problems, they would buy tiny replicas of whatever worried them - a car charm for a broken car, a tiny gun for security, a heart for love problems. They would pray over each item for a few weeks, then take it to church and pray for a *milagro*, a miracle. After that, they stuck them to the cathedral walls. Soon there were so many charms, they had to come down. I saw a business opportunity, and asked my priest friend if I could have them, since he just threw them away. He said sure, and I took them over the border and re-sold them in the U.S. I was also into crafts and flea markets in those days, and made such memorable items as solid copper neckties. To my amazement, they sold like crazy."

Shaking his head, he chuckled and said, "I put a little tag on them that said 'For the Man who has Nothing,' carried them into Bisbee's bars, sat and drank beer with the tourists, and sold them the ties."

Booth's flair for slogans would prove useful, but never more so than when he wrote and published *Confessions of the Killer Bee Guy*, a humorous look at the truths - and untruths - surrounding Africanized bees.

"The book is funny because Reed can't stop jok-

The bucket is labeled so everybody knows who is doing the work.



ing," said a friend. "He's an awful punster, and since bees are his business, he's probably used every bee-pun in existence and made up a hundred more."

"Well, it bee-hoooves me to replenish the supply," Booth quipped when I told him.

Confessions of the Killer Bee Guy is sold through his company, and mixes plenty of useful information with its humor. Schools use it to educate students about bee stings, treatment with antihistamines, and the evolutionary significance of the Africanized variety of bee.

"Beekeepers know that in their native Africa, these bees aren't aggressive," Booth said. "They're as mild-mannered as the European bees we've traditionally known. But interbreeding has changed their nature. Africanized bees are fierce attackers, capable of killing humans and animals. Trouble is, children often don't know that just one sting can kill a person that is allergic to bee venom. For non-allergic people, it takes around 500 stings as a rule, which roughly equals one rattlesnake bite. But when they swarm around you, it doesn't take much longer than a rattlesnake bite to deliver 500 stings. The only antidote is antihistamines. I carry Benadryl in my truck, and everyone who loves the outdoors probably should. It could save their life."

Pausing, he adds, "I think companies making First Aid kits should include antihistamines, because Africanized bees are still propagating."

That information will be in a Killer Bee Video Booth's company plans to release in 2007. It'll be perfect for schools," he said. "I'll advertise it on my web site and notify school administrators. Kids need educating about killer bees, which swarm often, increase rapidly, and hive virtually anywhere. There'll also be data in the video about other dangerous insects."

The mind of a marketer at work.

With every undertaking, Booth's knowledge of the business world and how it worked increased. But his

Continued on Next Page



— and so is the truck. It pays to advertise.

travels were not without perils. In Mexico, a .45 was stuck in his face and he was kidnapped – but was released when the Mexican girl he was with told the kidnapers she was pregnant. (She wasn't.)

Although it was 1991 before any bees buzzed into his life, his experiences proved helpful when he became a beekeeper and, eventually, a honey broker with his own product line.

The previous 10 years had been a busy decade for Booth, who worked many jobs to earn money. Slowly, it dawned on him that to succeed in any serious way, he'd have to be a professional.

A professional beekeeper?

Not quite, a professional gemologist, complete with a diploma from the G.I.A., the Gemological Institute of America in Santa Monica, California.

"Actually, I'd been brokering gems for some time," he said. "Some people gave me thousands of dollars worth of gems to sell for them, and of course I made a good profit. But there was an element of risk. A few made a point of telling me, 'If you don't sell these, don't come back.'"

In 1990, 31 but still stung by wanderlust, he got a bee in his bonnet and took off for Latin America. Brazil was rich with emeralds, and armed with his new knowledge from G.I.A., Booth planned to smuggle high-quality gems out.

He decided to learn Portuguese, Brazil's national tongue, and mastered the difficult language in ten weeks by traveling among the people and, in effect, abandoning English. While in Latin America, although bee-less himself in the U.S., he not only learned more about killer bees, but found that beekeepers there had adapted to them rather than re-queen. This was the opposite of what Americans were doing.

"I knew that if I was caught smuggling emeralds, I'd be thrown into a South American prison to rot," he said. The main hurdles were the border and the airport, so I decided to carry the emeralds out in my pocket. X-rays couldn't detect them there."

As luck would have it, the Brazilian authorities waved him through.

"It was a little different in the States," booth said. "They asked me what I was bringing into the county, and I said, 'Oh, just this weird doll I bought and a pocketful of emeralds.'"

They let him pass.

"Luckily," he said, "I returned home to a recession. It was the lagging economy that pushed me into trying to marry beekeeping to other things: I'd always been interested in the food business and had culinary experience. At flea markets, I saw that people selling jellies and food items did well. I wondered what food item I could come up with that people would buy. So I bought some honey and whipped up a concoction I called Honey Butter"

He was delighted when people bought it.

Soon he began experimenting with honey mustards, eventually perfecting 20 flavors and selling 15,000 jars a year. He was also interested in home brewing, especially mead. Contracting for additional honey to begin brewing, he refined his product into a superb mead, and has plans to market it. It so impressed a USDA hive inspector, she showed up at his door one day with a gunnysack.

"If you're going to make mead," she said, "you're going to need bees. Here!"

The sack contained the start of his first hive, and within a short time Booth had fallen in love with beekeeping. He studied everything he could find about the 5,000 year old art, even delving into the history of apitherapy. He has used bees to ease arthritis, including this writer's, and is eyeing the possibility of an income-producing Apitherapy Clinic in Bisbee.

"There's a market for pain relief," he says, "and few torments equal the pain of arthritis."

Booth still owns 20 hives, but most of his Killer Bee brand is wild honey from the Africanized hives he removes.

"I always tell those that want bees removed, 'I take the money and the honey!'" he chuckled. On a recent removal, anger overcame him at finding that someone has sprayed the bees' wild hive with insecticide.

"It doesn't kill the bees, and it ruins the honey!" he stormed. Over 150 pounds of prime golden honey were poisoned by somebody's stupidity.

"It's like throwing away a thousand dollars," Booth said. **BC**

William 'Chilly' Childress is a photojournalist and columnist from Folsom, CA.

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Varietal Honey Tasting - A Royal Experience

Robert Roeshman

Inspired by my personal collection of honeys from all over the world, an idea for a local honey tasting event blossomed. The variety, color and perceived taste of so many golden and amber treasures aroused the interest of one of my patients, Fred Parks, a retired chef/restauranteur, and member of our local beekeeping association, to bring a truly unique event to the public. Mr Parks joined forces with Ed Galgon, the chef/owner of a Mobil Travel three-Star



The author.

restaurant, Bill Mondjack, the president of our local Beekeeper Association, and Greg Fink, an accomplished maker of mead, and myself to organize the first honey tasting event in the Lehigh Valley in Eastern Pennsylvania.

We decided to introduce unique American single-flower honeys to a reservation-only crowd by offering a tasting and a honey-inspired four-course meal at Chef Galgon's historic Cab Frye's Restaurant and Tavern in rural Palm, Pennsylvania. As word got around, the event was

quickly sold out to a crowd as varied as the honeys. The featured honeys ranged from local Buckwheat and Apple Blossom to others like Orange Blossom and Avocado from California, Fireweed honey from Washington, and Camel Thorn from Arizona. The National Honey Board has a honey locator web site which we found very helpful in contacting distributors. In addition, Eucalyptus, Cat Claw, and Black Bottom Sage were presented drizzled, infused, and mixed into courses in the meal. Recipes were hand-selected from the National Honey Board publications and from Chef Galgon's years of experience to make up the menu and offer attendees an uncommon dining event.

After several months of planning and preparing place mats, flyers, favors, etc., the day of the tasting finally arrived. Like the foraging bees in the lush and quiet Berks countryside, early arrivals began to assemble on the garden patio where assorted cheeses and vegetables with honey condiments were displayed and presented to the guests. A buzz of activity and conversation began in anticipation of the dinner and guest speakers, and at last the event was underway.

The dining room was aglow in honey tones. Each diner was given a descriptive chart, five cups with different varietal honeys from light to golden, to amber and dark for guided tasting and informal judg-

ing. The "winning honey" of the evening's event would be announced at the conclusion. Pennsylvania State Beekeeping Association president Jim Bobb led the tasting by offering the pedigree and descriptions of the honeys. Bill Mondjack, president of the local Beekeepers Association followed with a colorful and passionate presentation on the tireless effort of bees just to produce the one-twelfth teaspoon of honey in a bee's lifetime. He encouraged guests to reflect on the mystery and beauty of the honey that they would enjoy that evening.

The sharply dressed and professional wait staff descended upon the tables, and the dinner began. The first course was baked Brie rolled in clover honey and encrusted with nuts accompanied by fresh seedless, halved green grapes, chopped apple, and sliced strawberries. The smooth Brie was wonderfully accented by the delicate honey Mixed baby greens tossed in a Black Bottom Sage dressing followed closely behind. The sweet and creamy dressing seemed to glisten on the greens and was a great alternative to run-of-the-mill dressings. By this time, talk about bees, shared experiences, and conversations about food caused the room to buzz like a hive. A delicious and refreshing Honey



Chef Galgon

Continued on Next Page

Scented Passion Fruit sorbet was served to cleanse the palate while the next speaker Fred Parks, one of the organizers and a former restaurateur, talked about the lore of honey. The thought-provoking speech focused on the "nectar of the Gods" of Ancient Greek mythology, the wit of Benjamin Franklin, an old German fable and Emily Dickinson's poem "The Pedigree of Honey"

*The pedigree of Honey
Does not concern the Bee;
A clover, anytime to him
Is aristocracy.*

In a graceful transition, the entrée, a Southwestern organic chicken breast was quickly served. An attractive vegetable medley, pure white Fireweed-infused rice garnished with a bright red seasonal crayfish filled the plate. The conversations paused briefly in exchange for delighted murmurs. What a treat



for the senses! The food was wonderfully seasoned, hot, and of ample portion size that left no one dissatisfied. The various single flower honeys had a subtle yet distinct influence upon the food. But another surprise was still in store for the guests.

Greg Fink, known for his clear and flavorful meads, took the po-

dium. A sampling of mead was poured for all as Greg entertained and informed us about the fermenting process and making quality mead. Honey-sweet with a high alcohol content, the featured mead had been made with Pennsylvania Apple Blossom honey and was an ideal accompaniment to dessert- an old-fashioned baked apple dumpling with vanilla sauce and drizzled with Eucalyptus honey.

Chef and owner Ed Galgon was finally able to come out of the kitchen and answered some questions about the meal and offered some tips about his experiences cooking with honey. As the event ended, diners submitted their vote for the favorite honey. Avocado honey was the most popular followed closely by Camel Thorn.

After the three-hour meal, it was clear that there was considerable interest in a second event. The First American Varietal Honey Tasting was a success. **BC**

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Honey Plants

Conn e Krochmal



Water Problems In The Bee Garden

Bee plants require many things. At the top of the list is life-sustaining water. Ninety per-cent of plant tissue consists of moisture. Though species can differ in their need for water, many prefer a steady supply at appropriate intervals during the growing season. Subject to the foibles of nature, bee gardens often suffer from too much or too little rain.

TOO MUCH RAIN

For areas that receive too much rain, there are various ways of managing the surplus. These address drainage and the selection of moisture-loving species.

One way of dealing with excess rain is to direct it to a desired spot, such as a bog or pond. Typically, this is done by digging ditches, swales, or furrows, or installing drain pipes.

The spot to which you divert the water can also become a rain garden – a particularly effective means of dealing with runoff. Rain gardens can be any shape or size as needed to fit the available space. For planting alongside the rain garden channel, choose plants that are adapted to wet conditions, such as aster, marsh marigold, mint, red maple, tupelo, willow, and yellow loosestrife.

Some plants don't like wet feet. Sage, lavender, thyme, and numerous other herbs are probably the best known examples. These prefer a dry, well-drained soil. If you want to grow such species in wet landscapes, build raised beds. This allows excess moisture to drain from the soil.

In chronically wet areas where the soil is heavy clay, the long-term solution is to improve the soil by adding organic matter. This promotes better drainage. For best results, add compost, shredded leaves, composted manure, or similar material to the soil before you till or prepare garden beds.

When possible, use disease-resistant plant varieties. Excess rain can promote fungal and bacterial infections. In low spots where drainage is especially poor, root rot can occur.

During particularly wet years, plants will often become yellow, sickly, and stunted. These symptoms are usually signs of nutrient deficiency. This results when heavy rains leach the nutrients from the soil. As a remedy, divert the surplus moisture from the bed. Then, fertilize the plants.

DROUGHT

While the wet garden suffers from too much moisture, the dry garden poses another kind of water problem. In some respects, the latter is easier to handle. Beekeepers have more options available when dealing with drought. Through the selection of drought resistant species and suitable garden design, we can make our lives easier when dry periods occur.

For the sake of simplicity, I'll use the term drought for both short and long-term shortages of rainfall. In much of the Midwest and East, short-

term droughts are common enough during the Summer months. At the present time, vast areas of the West continue to experience a prolonged, multi-year drought – a much more serious problem.

Watering

Along with drought comes the need for watering. The challenge is to provide the bee garden with enough moisture to minimize damage to the plants. Moisture needs to be applied to the root zone, which for trees is 12 to 14 inches deep.

Trickle and drip irrigation systems as well as soaker hoses are efficient methods of watering woody and herbaceous bee plants, while sprinklers are most suited to lawns. I set my soaker hoses in place around the plants, and leave them there for the rest of the growing season. Once these get wet, they're hard to move around from one bed to another.

Hand-held water hoses are convenient when a small number of plants are involved. These work particularly well for herbaceous species. Some hose attachments are made especially for use with plants, such as the wands and nozzles from Charley's Greenhouse and Garden (www.charleysgreenhouse.com). These break the force of the water flow so it doesn't harm the foliage.

When using a hose to water large woody plants, it's hard to apply enough to the root zone. In this instance, a soaker hose comes in handy. If you prefer to use your regular one for this, set it within the drip line of the plant, and let it

Continued on Next Page

trickle until the soil is saturated. With this method, you'll need to move the hose a number of times to water the entire area around the tree or shrub. Keep the water flow low enough so that it slowly soaks in. If you see signs of runoff, this is set too high.

In areas where short Summer droughts are the norm, bee gardeners will probably want rain barrels. It's a shame that old-fashioned cisterns are no longer common in rural areas.

For many kinds of garden plants, so-called gray water – a term referring to water previously used for household purposes – is an alternative. Some areas ban its use. Check with local authorities if you believe regulations might be in place. Avoid using any gray water that contains high-phosphate cleaners or water-softening agents.

With watering, there are two factors to consider – the frequency and the quantity. The larger the plant, the greater its need for water. Apply enough to thoroughly saturate the root zone; then allow the soil to become reasonably dry before watering again. Frequent, superficial waterings encourage garden plants to develop shallow root systems, making them vulnerable to drought.

To a great extent, the soil type determines how much and how frequently you need to water. With clay, you won't have to water as often. However, you'll need to apply much more at a time than you do for other soil types. Sandy soils dry out quicker, but their water-holding capacity can be improved by adding organic matter. Suitable materials include compost, leaf mold, and worm castings. Other composted materials also work very well, for example sawdust, seaweed, shredded newspaper, yard waste, and straw.

The plant's exposure can influence its needs for water. Because the afternoon sun is so intense, garden spots in southern and western exposures will likely need watering more often.

Which bee plants should be watered during dry periods? Usually, it's best to set priorities. Care for the most important ones, such as trees, shrubs, and new plantings. Unless they're ones that require a

constantly moist soil, most established plants will be fine during a Summer drought. Herbaceous perennials often respond to dry conditions by going dormant. Don't be alarmed. They should show new life once rains return in the Fall.

Water only when the plants need it. Monitor them. Be on the lookout for signs of stress, and water when these are present. Such symptoms include diminished color, absence of growth, lack of vigor, and wilting in early morning before the sun is up. When a plant is drooping in the evening, this can be a temporary response to heat.

Whatever type of watering method you use, provide the system with proper maintenance. Leaks – a common enough occurrence at hose connections – should be repaired in a timely manner. Irrigation systems can get clogged, especially if hard water is used.

Perhaps you've seen ads for water-absorbing crystals. When added to the soil, these store moisture and release it on an as-needed basis. However, I don't recommend these during a drought. You will actually need to apply additional water to keep these crystals damp.

Garden Maintenance During Drought

Routine garden maintenance is particularly important during dry periods. At other times, you might be tempted to ignore weeds in the bee garden. This laid-back approach doesn't work well during a drought. These fiercely competitive species will rob the precious moisture from its rightful heirs.

Mulching will go a long way in minimizing weeds and conserving soil moisture. A two to three inch layer of organic mulch is sufficient. More isn't better. Among the more commonly used ones are wood chips, pine needles, and bark mulch. Always water right after you apply the mulch. Otherwise, it will absorb moisture from the soil.

During a drought, stone and brick chips, and similar inorganic mulches are unsuitable for hot areas. These tend to absorb and radiate heat, thus increasing the rate of evaporation. I haven't tried the ones made from recycled rubber to see how they respond to dry conditions.

Anti-desiccants will help newly planted trees and shrubs, particularly during hot, dry weather. One of the most commonly available brands is



Wilt-Pruf, but garden centers will have others as well. These sprays limit evaporation from the foliage, and minimize plant stress during dry periods.

Go easy on the fertilizers. Unless you plan to water on a regular basis, avoid their use during a drought. If you do fertilize, choose ones low in nitrogen (the first number listed on the fertilizer label).

Soil salinity can become a serious issue during dry periods, especially in parts of the arid West. With the lack of rainfall, these soluble salts accumulate in the soil. The result is often plant damage. To minimize this potential problem, improve drainage, add organic matter, and stop fertilizing during dry spells.

Proper Garden Design

Good garden design can simplify the bee gardener's life when dry periods occur. With prior planning, we'll be prepared. This involves appropriate plant selection and groupings, and becoming aware of microclimates within the landscape.

First, group the plants by their water needs. What you want are separate beds for moisture-loving species and those that prefer dry soils, such as gaillardia, prickly pears, thrift, and yarrow. If you mingle the two types in the same area, you'll end up dragging a hose around to spot water.

When you live in a drought-prone area, take advantage of whatever shade is available. These spots won't need watering quite as often. Bee plants suitable for partial to full shade include avens, bear's breeches, cardinal flower, coral bells, hellebore, and leopard's bane.

I've noticed certain sections of my bee garden dry out very quickly on windy days. For that reason, garden designs should include windbreaks on the windward side. These will slow evaporation of soil moisture.

Appropriate garden plans will feature terraces on hillsides and banks. If you've ever tried to water a plant growing on a slope, you know how frustrating this can be. The water follows its natural flow, running down the hill before it reaches the plant's roots. Terracing captures the moisture by giving it a flat area where it can be absorbed.

Within the landscape, some areas will be hotter and drier. This can be due to exposure or reflected heat/sunlight from buildings, fences, patios, paving, and walls. For best results, use drought-resistant species in these vulnerable microclimates.

In areas where dry weather is likely, I recommend using a mixture of drought resistant bee plants. Examples are native trees and shrubs, and wildflowers. Among these are blazing star, coneflower, goldenrod, and joe-pye-weed. Choose perennials when possible, annuals need more water.

Plants that can withstand dry conditions often share some common characteristics. They tend to have small foliage, which serves to limit water loss. Typically, the leaves are hairy, and often gray or silver in color. Examples of such species include lavender, poppy, and lamb's ears.

It also helps to choose bee plants with mounding, spreading growth habits, such as purple rock cress. These cover the soil, and minimize water loss.



Effects of Drought

Drought puts tremendous stress on plants. The long-term effects are somewhat unpredictable. It depends partly upon the initial health status of the garden plants and their water requirements. For example, moisture-loving species and those that start out weaker will probably suffer the most. In addition, drought can make plants more susceptible to secondary damage from insects and diseases.

A drought's effect on nectar and pollen production, the results can be mixed. While some bee plants will produce less, others will actually yield better in drier years.

It's rare to find an area that is blessed with just the right amount of rain. These tips for the bee garden can help you with those in-between times when nature brings gully washers to wet areas and occasional rains in a hit-and-miss fashion to parched, dry areas. **BC**

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

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Video Taping Hot Bees

James E. Tew

How not to make an action movie

They will be here in a couple of hours

When I made this appointment months and months ago, it felt as though the date would never arrive, but even if this day ever did come, I would – somehow – be completely ready for it. But today is the day, and I am far from ready. Even though it's a low-key video shoot, I still have some knots in my stomach. The video people are not trained bee people and I will need to avoid all stings (and I don't really want too many on me.)

I don't do this video thing often enough to be good at it, but I have done it enough to know that it can be bad if it goes wrong. My responsibility becomes how to make things go as right as possible. While admitting that I am not trying to sell myself to you as a professional film maker, I would like to offer suggestions to those who are going to be making bee movies in the future.

Over and over again.

There is a good chance you are going to see this video footage again and again. If mistakes are made, they will be made over and over again each time the video is shown. It's painful to watch the same mistake made time and again. I always feel like a slow learner who just can't get it right. Obviously, the best time to address errors is before they are made. From the start, be careful.

When scheduling the event, I requested a list of

Part of the larger yard to be video taped.



possible questions that the company, a text book company based in Columbus, Ohio, would be posing. Straight away, a list was sent along indicating that most of the interest was in Africanized honey bees, a rather old, even tired, topic. At least, I was forewarned. To this point, I had an idea of who the company was and what they wanted to discuss. I contacted some of my peers who had already worked with these people and got good reports. That's about all I can do to check out them out while still having time to cancel.

The yards.

Right now, I and my bees are in mid Summer and thus far, this has been a reasonably hot one. The colonies that died last Winter are still completely dead while the ones that survived are busting out strong. Generally, the past Spring was wet with good showers and good nectar flows. My colonies are packed out and the grass seems to grow even as I cut it. Initially, in preparation for the shoot, I justified the yards looking pretty scruffy, but trying to take my own advice about seeing things over and over, I tried to neaten things as much as possible.

I chose two locations that were quite near each other. One, a large yard having about 40 colonies situated in full sun, is a no-nonsense yard with strong colonies having bee beards on the fronts of many of the hives. These hives needed more supering while I needed more time. Neither of us got either. Most of these hives are now hot, strong and crowded.

The second location is a much smaller, shaded yard with more beekeeping ambience and far fewer hot bees. The second yard is primarily new colonies that I started from packages this year. They have progressed nicely and I felt that these would be easier colonies to open without the mess of heavy supers.

In both yards, the grass was tall while the time to prepare was short. Sherry, the bee lab manager, ran a large push-mower while I ran a string trimmer. Mowing the grass down made things look so much better that I decided to open a couple of the colonies just to be sure that the propolis and burr comb were cut loose. What a shock! The packages were much, much more developed than I was expecting. These colonies were packed with bees and burr comb. Maybe some of you know the situation. The inner cover was soundly stuck down requiring much work with an over stressed hive tool to break things loose. Bees, sticky honey, and heavy bee equipment was everywhere.

Even though it was frustrating to find colonies so

A smaller, friendlier yard.





A crowded, messy colony.

crowded, part of me was happy to see a young, strong, progressive colony that had filled all available storage space. Normally, I would not waste time and bees scraping burr comb from top bars, but there was a good chance that these colonies would be shown to the world within a few hours. What a sticky mess, but the task went quickly. We moved to additional colonies and found the same situation. If anything, the other colonies were even more crowded. Enough already. Even if I was in a terrible time crunch and even if many other colonies were undersupplied, these colonies simply could not be left this way. I rushed to the storage barn retrieved several empty deeps and rectified the problem.

The video crew

Before I could finish lunch and a full 45 minutes early, the video crew arrived. It was only two people and they were both personable. As improbable as it may sound, one of the fellows was actually the son-in-law of an old time Ohio beekeeper who has since moved to Colorado. It is a small world. After chatting for a while and getting an idea of what was expected, we made plans to move to the yards.

As is typical for professional video people, they were nonplussed about being around bees. Even so, I wanted them protected from stings so I suited them up as though they were preparing to walk on the moon. Off to the yard we did go. I lit smokers with long-burning wood chips and stood by one of the hives, looking as though I had every answer under the hot sun.

University media trainers have always instructed me to answer questions very briefly and succinctly. I always try, but I always seem to lose. "Why is it Africanized and not African?" "Is anything being done to monitor their advances?" "How did they get the name Killer Bees?" And on and on it goes. While I try, I stumble. I stutter. I repeat myself. It's not very easy. But the crew was amicable and things went along pretty fast – even painlessly.

As an aside, I can say that all crews are not equal. Some are intimidating. Others are more demanding of me as though I am some kind of bee actor. I'm not. The fellows today were much more relaxed – professional, but relaxed.

Sherry working a hot, crowded hive.



Bee suits and protective gear.

I had the video people completely protected. They were very hot, but they were protected. But what about me? Should I be totally veiled and gloved – looking as though I am about to challenge demons? Alternatively, if I look too casual, I could leave the unintentional impression that one can easily work bees with minimal effort.

When answering questions and not actually working the bees, I left my veil back and I did not wear gloves. In fact, I suppose I did look casual. But as we moved to the second yard where the populous hot colonies were, I did put the veil on. And though I carried gloves, I did not wear them.

That one bee...

Of the hundreds of thousands – even millions – of bees that I was around, I managed to offend one bee – a single opinionated bee. The entire time I was talking, she was dive-bombing my delivery. It is so very hard to be cool when a bee is crashing into your nose and banging into my lips. Plus, the noise she was transmitting

In the sun with the bees and the camera rolling.





An exposed Nasanov gland on a scenting bee.

to the microphone I was wearing was dramatic. I was never stung, but the stress was tiring. My impulse was to smash the bee, but that entire process would have been caught on tape so I tried to look unconcerned (*but all the while, rest assured I was very concerned.*)

Rolling with the flow

I would love to have you believe that I can script a bee video shoot and everything work out perfectly. Hardly. Of all days, today was the day that hay bailers were literally at work within my yard. Go figure. I have spent hundreds of hours in that yard perfectly alone and on the day that we shoot some video, three tractors, two trailers, a skid-steer loader and three trucks are coming/going with an unimaginable racket. At my request, the workers took a break, but while I would like to tell you they were friendly about it, they really weren't.

Happily some things do work out well and are

readily photographed. For instance, bees around broken honey cells and surrounding burr comb make good close-up footage with professional cameras; or bees scenting at the hive entrance – rear ends raised and wings at full power. While this event is common for beekeepers, it is a biological wonderment for those not routinely working with bees.

Not being able to sting, drones are always a hit. Bees feeding each other and the differences between worker and drone brood are easy observations to make.

But the #1 event within the hive – the event that always stops traffic – is finding the queen. That is uncontested. In order to facilitate this observation, I located the queen in a nucleus hive I had set up just for this purpose. I caged the queen and closed the nuc up. As the need arose and the camera people were in place, I gently released the queen onto a brood frame where she was readily received. It worked nicely. We got good shots of workers, drones, and the queen.


It was a good day – but not perfect

The heat of the day was the primary challenge for this event. Never mind the large numbers of bees and the clumsy video equipment, sweat running into my eyes and then soaking my clothes. I didn't feel very photogenic. We had water for drinking and for washing away sticky honey, but it didn't help very much. I needed a pool.

Now the event is out of my hands. Some faceless video editor will put it together and make it come to life as a video production. It will be a short piece. I suppose I could ask (demand?) to see the footage before it becomes final, but I didn't ask for that privilege.

All in all, things went very well today, but these days are never perfect. True. It was hot, but that is much better than being cold. My hive equipment is not the greatest so I wasn't able to show beautiful hives and yards, but for the present, many of the colonies look good. Even better, I actually did some bee work while this video thing was underway so I was able to double task. Now I must wait to see what I said. **BC**

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



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BEE CULTURE

August 2005

PACKAGES FROM DOWN UNDER

Alan Harman

Australia's geographic location makes it ideal to ship live bee packages to the U.S.

There could be a golden honey pot at the end of the Pacific rainbow for Australian live bee exporter Terry Brown.

Australia's geographic position in the southern hemisphere makes it an ideal base to ship live bee packages to the United States. With the seasons opposite, he can ship packages to the U.S. early in the season there - before local packages are available.

And after 15 years of trying he has managed to successfully sidestep all the obstacles and send his first shipment to the United States, which he believes could quickly become his biggest market.

Those 15 years were taken up overcoming opposition from the American side. Opposition based on perceived health issues kept coming into the U.S. Department of Agriculture. Each time the Australian Quarantine Inspection Service (AQIS) cleared bees of one health issue, another one would be raised.

Brown, who said his Browns Bees Australia Pty. Ltd. business was a hobby that got out of control, has shipped live bees to about 15 countries since 1982.

In an interview before heading to the U.S. to meet beekeepers and assess the results from the first shipment, he said the U.S. is now squarely in his sights.

"While it is having problems with disease - *Varroa* and tracheal - the demand will be ongoing," he said.

"We can supply clean, disease-free bees when they want them. I think the Americans are very happy with the progress of the bees in that first shipment."

And with industry scuttlebutt putting the U.S. some 500,000 hives short of filling pollination contracts, Brown could be in the right place at the right time.

Because of the opposite seasons he can have his bees installed and operating in the U.S. when domestic breeders are still preparing their packages.

The Australian breeding season runs from early October through to early May.

"In mid-July we start looking for early breeding conditions and by mid-October we can start exporting.

"We are in a good location for the northern hemisphere. Our mid to end season is the northern spring and we are in full swing when they just starting up."

Southern states can have the Australian packages installed in late December or early January, right at the start of the American pollination season.

"We have the advantage," he said.

Before any bees head off to California their hives are inspected by the Australian Quarantine Inspection Service on behalf of the U.S. Animal and Plant Health Inspection Service for eight diseases - American and European foulbrood, small hive beetle, half moon virus, chronic bee paralysis, Kashmir bee virus, malpighamoeba mellicae and megalosporosis.

Brown said none has ever been found in the 2,800 hives he operates at Mendooran, about 315 miles north west of Sydney in central New South Wales.

Brown traveled with his first shipment to the U.S., made up of an aircraft pallet with 384 four-pound packages of bees, each with a queen that went to San Francisco.

Days later a second shipment the same size reached Los Angeles.

He said they arrived in Los Angeles in fantastic condition and were cleared through entry procedures in about two hours. The bees were first used in California for almond pollination before moving to Missouri to work in the apple orchards.

During that time they bred up fast and the owners had to do swarm control.

Brown, one of two Australian operations exporting packaged bees, produces up to 50,000 queens and as many as 11,000 four-pound packages a year. If demand soars he can source bees from other beekeepers.

Some 85% to 90% of his production is for export.

Brown now employs eight people full time with his business.

"We can increase operations to meet any U.S. demand," he said. "Advance orders of a month or so would allow us to get prepared and start shipping."

If demand grows he can increase the number of hives to meet demand.

His bees come from the best Italian and Buckfast stock he can import using a unique Australian quarantine system.

The imported bees go into permanent state of quarantine at a facility operated by AQIS.

"We get the larva out of quarantine and artificially inseminate queens," he said. "When we finish the imported bees are killed and burned."

Terry Brown (right) with Missouri beekeeper Glenn Davis and the pallet carrying the first Australian bees in San Francisco.





Collecting the bees destined for the U.S. at Terry Brown's operation in central New South Wales.

He has crossed the Italians with Buckfast and the Buckfast with the Australian stock and said the hybrids have up to 30% more vigor.

"Our local Italian stock is darker and more aggressive," he said. It is a hardy stock with good disease resistance."

Using the quarantine facility Brown said he can produce any race of queens wanted by customers by going to their country of origin, shipping them to Australia and breeding their offspring.

He expected to pick up orders for next season during his visit to California, Missouri, Florida, Georgia and Texas.

"There is a lot of interest from different parts of the U.S.," he said. "I will meet people . . . tell them what it involves. Most people expect the market to come to them."

The advent of long-haul jets has also opened the U.S. trade as Australian bees can't be transhipped through Hawaii.

To avoid the Hawaiian bottleneck he has at times shipped bees to South Korea and then non-stop to



Vancouver For the last two years he has flown them on British Airways to London and then on to Canada.

For the moment Brown is targeting the U.S. south and the west coast while he looks to find ways to overcome another road block preventing him shipping to the U.S. East Coast.

Changing to a domestic carrier makes the costs prohibitive. Brown said these costs for shipping from California to the East Coast are higher than for Australia to California.

Brown operates on tight margins and with air freight rates "quite expensive" he looks to volume to keep prices economic to beekeepers "so we both can make money."

He said Australia can supply "fresh, clean, happy bees that get through their first U.S. season without chemical treatment for *Varroa*."

The Australian bees will get a small amount of *Varroa* before the U.S. season is over and they will have to be treated at the end of the season, he said.

But in that first chemical-free season they are highly active.

Brown said that with his first shipment arriving to two weeks of miserable weather the local bees were still in semi hibernation while the Australian bees worked full time through drizzly rain.

That has him seeing a good long-term market – and a big American welcome – for his now welcome Aussie bees. **BC**

Tough Times Ahead For Australian Beekeepers

Low global honey prices coupled with drought-induced lower production are signaling tough times ahead for Australian beekeepers.

Infestations of the recently discovered small hive beetle are also hurting.

"The prices have declined well below half what they were at their peak," New South Wales Apiarists Association president Billy Weiss told ABC Radio.

"Increasing production means there's still an oversupply in the world market to a degree. World prices are depressed, and Australian prices have reflected that.

"It's quite a stressful period for beekeepers because we probably are entering a low production period with bees in bad conditions, and a low commodity price, which makes it difficult to sustain our business."

Off We Go Into The Wild Blue Confusion

Ann Harman



Once upon a time the only thing we feared about international travel was the customs inspector at the airport. Today nobody even thinks about the customs inspectors. The security check episodes are now the conversation topics among our co-workers, neighbors and friends. Each of us hopes we have the security check story to beat all security check stories. However, lately it seems that security check stories are becoming less frequent, perhaps giving way to discussions about airlines and the curious habits of those we have encountered in foreign lands. Security checks have become a way of life, not only for local travelers but also those who fly internationally.

Obtaining tickets is possibly the first challenge you will encounter when you have decided to travel. The Internet offers all sorts of information and pricing, but is it always the best for international travel? Not always. Are travel agents, now becoming a rare breed, the best? Not always. Is an airline the best? Very possibly but now some are charging for their services. What is interesting is that I tried to book a round trip across the pond on the Internet using my frequent flyer miles and found really unsuitable flights and connections. Furthermore I was spending an incredible length of time trying to do this. In frustration I called the airline and although I did have to pay a small fee, the service was superb, the flights and connections were ideal (nothing like those offered on the Internet) and the price was right and the time it took was only a few minutes.

One trick of ticketing is to discover the time allowed between connections. I have been advised that one hour between time of arrival and

departure time is a "legal connection." Nonsense. Whoever thought that one up never galloped from Terminal A, gate 63, to Terminal C, gate 34. Time of arrival is when the wheels of the aircraft touch the ground. "Ladies and gentlemen we have arrived at (fill in airport name) on time!" Even if the plane is on time it still has to taxi to its gate, wait if the gate is occupied, get settled in its berth, do all the necessary checks, and finally offload 300 people up a narrow aisle. Well, there went that hour. If someone is making my reservations I look carefully at the time interval and politely but firmly refuse a one-hour gap. You need to do the same for a peaceful trip.

Airlines offer frequent flyer miles. Why don't airports offer frequent-walker miles? Don't be fooled into thinking "Gate 1" is the first one you come to. The number system depends on the whim of the airport. Sometimes Gate 1 is at the end of the line of gates.

International travel starts at home. A quick trip on the Internet provides us with weather information at our destination, at least for a few days of the trip. While you are checking that, go ahead and see what your hometown weather will be so you know what you'll be missing. This destination weather will give you a clue what to pack - woolly sweaters or a cool shirt, umbrella or sunscreen. While you are on the Internet, put in the words: foreign exchange. Now you will get an incredible list of countries and the exchange rate for dollars. Now print out the table of dollars to thingys and the list of thingys to dollars. Now when you see a trinket that costs 68,000 thingys you'll know it's only \$3.50.

Now it is time to dust off the

suitcase. Decisions: one big or two smaller ones? Hard sides or soft sides? Murphy's Law - if you take a softside one you will find an absolutely have-to-have souvenir made of pottery or you will be presented with a glass jar of honey. OK - you want to go softside - but pack a good bit of bubblewrap. You can always abandon it over there.

Oh - you need to buy a suitcase? International travel is notoriously hard on suitcases. Wheels fall off or get bent - one going east the other still going north. Handles disappear. Somewhere in this universe is a huge nebula made of suitcase handles. In the luggage shop you will find plenty of choices - as long as you choose black. Everyone in the world travels with black suitcases. However, please note - the latest fad appearing in suitcase colors is red. So there is no point in buying a red suitcase for easy identification. Soon everyone in the world will have a red suitcase. What you need to do is find a luggage tag in a frightening color. I found some in a hideous day-glo chartreuse. They do not look business-like or professional but I can sure see my suitcase as it comes around on the carousel. If you can't find an ugly tag, tie some brilliant surveyor's tape or colorful Christmas ribbon to the suitcase handle.

My most valuable piece is my backpack. It leaves my two hands free to handle tickets, passport, money, and it carries a change of underwear and socks, toothbrush and a few other vital things. (Do you really think that your luggage won't be delayed?)

Now it is time to decide what to pack. Rule #1: if in doubt, don't take it. You may have to lug your suitcases up and down stairs, stuff it into the trunk of a too-small taxi, or sit with it on your lap. At your destination, if you find you really needed that something, you can buy it. Shops abound absolutely everywhere - from the latest French and Italian fashions down to the street kiosks with cheap, "pirated brand name" stuff.

All sorts of travel magazine articles say to buy some mesh bags or use plastic bags so the security people can see the items inside. Guess what - the security people will open them up and rummage

Continued on Next Page

through the contents if they want to. Plastic baggies are great, but for other purposes: socks that got wet from the rain, souvenirs, the bubble-wrapped jar of honey, and a sandwich-size baggie for your loose change. You will appreciate being able to pull a baggie of change out of your pocket or pocketbook when going through the security checks. So much easier than scooping up several dollars of dimes and pennies.

PUT YOUR POCKETKNIFE IN YOUR CHECKED BAGGAGE NOW.



Suitcases are now all packed. Time for the duct tape routine. You see, you cannot lock suitcases now. True, some have a sort of universal lock that can be opened by airport personnel. That may work unless you are going into a less-developed country or into small airports. So you will purchase a small roll of duct tape and put a strip over each lock or latch. If you have zippers, tape down the little zipper pull. If you have a hard-side suitcase with a pull handle put a long strip on the side of the suitcase. This will be used when you step up to the check-in counter. Put this long strip over the pull handle, taping it to the sides of the suitcase. All this gives you reasonable assurance that the pull handle will arrive intact and that the latches have not sprung open dumping your stuff all over the floor somewhere. Now put the rest of the roll of duct tape in your backpack or briefcase or pocketbook. That roll is a valuable item!

DONT FORGET YOUR TICKET AND PASSPORT.

Off to the airport. You may be leaving home from a small, local airport but for overseas you will be traveling out of a large hub airport. These have long lines – for check-in, for security, for boarding, for whatever. At the other end, your destination, there will be long lines for passport control. People used to traveling and traveling alone usually have a book or magazine in hand to read. People traveling together usually have



grumbles to share. Time to learn a dance step. This is a Line Dance – easy to learn since everyone else in line is doing it. It goes: shuffle, shuffle, shuffle, kick. The shuffle is you going barely a few steps forward in the line. The kick is delivered to your carryon or briefcase so you don't have to pick it up and move it eight inches. Music? Oh yes. Plenty of cell phones tinkling away.

Once you've checked in it is time to head for the security line. Now one would think there is some consistency in security checks. Well, there is – the only thing consistent is the inconsistency. Will you have to remove shoes? Sometimes yes, sometimes no. Will you be chosen for opening up briefcase or pocketbook or backpack? Yes and no. Will you have a wand passed over you? (Attention frogs – you will not be turned into a handsome prince by the wand.) Sort of depends on the country and airport. Will you be “patted?” Maybe yes, maybe no.

You can tell seasoned travelers by their shoes. Those who travel frequently are not wearing shoes that have laces. They may be wearing sandals or easy-to-slip-into moccasins. My travel shoes have Velcro® straps. I can actually undo these and fasten them up with my foot/shoe. Furthermore they are black – the color of dirt and grime. There's a pair of much-appreciated shoes.

Once through security you are in the world of shops, restaurants and Duty Free! Fortunately you can find well-displayed maps showing you where your departure gate is located, plus where and what kinds of shops and restaurants you will encounter on your walk to your gate. Once you know how far it is to your gate you know whether you can dawdle along or go at a brisk walk.

Once at your gate you really do not have to do anything at the counter. But a wise move is to ask if you will need to show your passport along with your boarding pass. That saves a bit of fumbling. Some airlines do, some don't. One other thing you can do at the gate counter – especially important if changing flights or airlines – is to ask if your luggage is on its way to *your* plane, not going somewhere else or forgotten. It is

easily discovered with your baggage check stubs. You can make this baggage check at each of your stops.

Once aboard, sit back, relax. You need to be ready for landing. If you are arriving at your final destination overseas you will first encounter Passport Control. Here's another opportunity for the Line Dance – I hope you remember it from your departure airport. In some airports the line moves quickly and easily; in others it seems like it takes forever. Sometimes it depends on how many large planeloads have landed about the same time. Sometimes it depends on the time of day and the efficiency of the system. Just keep dancing.

After collecting your baggage you now have a choice of Red Lane – with items that may need customs inspection or Green Lane – with items that do not need inspection. If you are carrying something that looks particularly weird you can be stopped for inspection in the Green Lane. Just use some common sense.

Now if the overseas landing is not your final destination you will enter a time warp known as In Transit. Here you walk down corridors sealed from the rest of the world, up stairs, down escalators only to reappear at a security check. Please go back in this article to the information about security checks. Nothing has changed. But cheer up. Once through this security you will enter the world of Duty Free! Only now you are in another country and the offerings are both the same and different. The perfume, cigarettes and liquor are the same but the souvenirs are totally different.

Your return home, back to the United State will be the whole scene all over again. You'll be glad for the easy-off shoes and the loose change in a little baggie. And the bubblewrap protecting a precious souvenir. And the duct tape that you didn't think you'd need.

Now you have some stories to swap – on security checks and curious habits.

Oh – I nearly forgot – Bon Voyage! **EC**

Ann Harman makes her home in Flint Hill, VA, but she travels extensively to places you and I can't spell or even pronounce.

New Jersey's Response To The Effect Of Urbanization On Beekeeping

Cynthia Ann Werts

As in many states across the nation, urbanization in New Jersey has increasingly compromised opportunities for beekeepers. In responding to this issue, the New Jersey Beekeepers Association (NJBA) decided to reach out to the public using various marketing approaches. This has turned out to be a challenging process as there are conflicting schools of thought as to the best way to educate the public and the politicians.

Bob Hughes, President of the NJBA, recently presented Ray Markley, in recognition of his efforts, with the first copy of 23,000 decals produced for public distribution. Ray said, "The problem that presented itself to me was actually started years ago when several towns passed ordinances against keeping bees. It seemed so foolish to me, if the public had any idea of what they were doing, how to educate the public was the problem that needed a viable solution. Jake Matthenius (NJBA Research Committee Chair) told me many years ago that I was the educational president because I was a professional educator and that gave me special purpose. I am very pleased with the results and I am hoping that my objective will be reached. We just have to wait and see if it works."

Perspective

New Jersey, better known as the Garden State, is no longer a state of full-time farming that provides produce for New York and Philadelphia. With very few exceptions part-time farmers now carry the load. Except for horticultural products, agricultural production has all but been lost in the northern counties of New Jersey. These counties are now among the most densely populated areas in the United States housing 5000 to over 13,000 people per square mile. Prime agricultural land continues to be lost as bedroom communities extend from the big cities. This transition in land use has also brought with it an urban framework of thought affecting beekeepers.

The honey bee was once recognized publicly as an ally in food production. In 1974 the New Jersey legislature selected the honey bee as the state insect. However in 1983 the New Jersey Right-to-Farm Act failed to mention beekeeping or its

importance as an agricultural pursuit. To the urban mind, the honey bee is associated with a risk of stings and systemic allergic reactions, the newest face of entomophobia. A knock at the beekeeper's door could bring a Health Inspector or Zoning Officer quoting an ordinance that forbids "the keeping and raising of any animal other than horses or more than five domestic pets" or "Any use of any building or premises in such a manner that the health, morals, safety or welfare of the community may be endangered."

Faced with this mounting urban pressure the composition of New Jersey beekeepers has changed and so has the NJBA. Beekeepers with hundreds of hives once dominated NJ beekeeping. Paul Raybold, the NJ Bee Inspector for more than 20 years, in an interview in April 2004, estimated "about 2,500 people maintain a total of about 6,000 honeybee hives throughout the state." Currently only three are commercial pollinators. Some of NJ beekeepers have 50-100 hives but the majority are small, with 1-10 hives. The hives of many of these small beekeepers are located in urban and suburban areas providing pollination for residential gardens. Unfortunately their location provides ideal conditions for classic confrontation between agriculture and urbanization. Despite urbanization, honey bee pollination remains critical to about \$200 million worth of NJ annual agricultural production including vast expanses of blueberry and cranberry fields in southern NJ and many kinds of flowering vegetables and fruits.

Efforts to aid beekeeping

The NJ Beekeeping Association, formed in 1902, has long recognized that urbanization, though occurring slowly, places intense pressure on some of its members. What approach should be taken to counter these negative policies? A mug? Calendar? T-shirts? The intention was to distribute them at farm markets and roadside stands as well as the annual agricultural conventions and county fairs. Cost would be important, as would the political and educational effectiveness.

At the Fall 2003 Executive Board Meeting, then President Dan Kurela appointed a committee of four people, M. Stanghellini, R. Markley, D. Kurela, and C. Werts to work out the graphic details, and plan production. At the 2004 winter meeting it was announced that a decal would be

printed, to be placed on the window of a vehicle or home. Each member would receive one, as would people who supported beekeeping. But what should the decal look like and what information should it present?

The first attempt focused on developing a "lovable" artistic rendition of a bee on a flower with a banner at the bottom saying "We Support Beekeeping" in bold letters. Above the bee the words "honey, health and pollination" would emphasize the positive role of honey bees in human culture. Finally, recognition of the NJ Beekeeping Association, its inception date of 1902, and the Jersey Fresh publicity logo were attached. This approach would emphasize the NJBA identity as a beginning of direct action to gain political and governmental support.

Once examined closely the committee became critical of this approach. Led by Ray Markley's vision of a decal focused on picture of a real bee and emphasis on the role of bees in food production, committee efforts were redirected to a decal focused on basic education.

Markley, a former president of NJBA, stated "Because I knew that the honey bees were the major player in the pollination of commercial crops, I decided to develop a public medium that would educate and make people think. The honey bee takes the blame for the yellow jacket mainly because people don't know the difference. I wanted to make the honeybee picture available to the public so they might see the difference."

With this goal in mind, accuracy and photographic clarity became paramount. Mike Cassini, the photographer, provided a bee on a contrasting colored flower for clarity. The photo dominated the decal in the hope that recognition of a real bee would ease urban fears. The question "Did you know that the honeybee is responsible for 1/3 of your food?" was added in the hope that readers would reflect on the importance of the honeybee in their welfare. Finally "Support the State Insect" was added.

Seventeen months were needed to complete the two competing decals to the membership in graphic form. The approach championed by Ray was selected in a vote by the membership and the decal is being distributed to branch chapters of the NJBA.

Will education work to change public opinion? Will NJ beekeepers continue to care for their bees in fear of state or locally imposed limitations? Only time will tell, but the effort continues. **BC**





? DO YOU KNOW ?

Varroa and Colony Losses

Clarence **Collison**
Mississippi State University

Having just recently been involved in two beekeeping workshops/meetings in Maryland and Kentucky, beekeepers are still searching for information on how to control *Varroa* mites and questioning why several commercial and hobby beekeepers experienced such devastating colony losses this spring. Another problem that some beekeepers have experienced in Kentucky in their queen rearing program, is that queens failed to emerge from their queen cells, even though they were fully developed and appeared normal. Are

these problems associated with parasitic mites, viruses, diseases, nutrition, genetics, queen quality, drones or resistance to fluvalinate, coumaphos, and Terramycin? In addition, these workshops were concerned with basic bee biology and colony management related to producing a honey crop.

Please take a few minutes and answer the following questions to determine how familiar you are with these important topics.

Level 1 Beekeeping

1. ___ When a honey bee egg hatches, the young larva chews its way out of the chorion. (True or False)
2. ___ Drones produced from eggs laid by laying workers are sterile. (True or False)

There are two chemical reactions associated with the fermentation of honey. In the first reaction, the sugar-tolerant yeasts feed on the glucose and fructose in honey to produce 3) _____ and 4) _____, then breaks down into 5) _____ and 6) _____ in the presence of oxygen.

7. ___ During the Summer, individual adult female *Varroa* mites produce more than one generation of brood. (True or False)
8. ___ Pine trees are an excellent source of pollen for honey bees. (True or False)
9. ___ Tupelo honey is a product of the south and is produced by trees that are generally found in swamps and wet lowlands. (True or False)
10. In order to kill yeast cells in honey to prevent fermentation, it is necessary to heat the honey to 145°F for ___ minute(s) or 160°F for ___ minute(s) or some gradient between these two temperatures.
A. 60 B. 40 C. 1
D. 20 E. 30
11. ___ An adult *Varroa* female mite lays more eggs in drone cells than she does in worker cells. (True or False)
12. ___ The rosy condition associated with American foulbrood can be demonstrated when the larva is:
A. Dull White B. White
C. Yellow D. Black
E. Brown

Advanced Beekeeping

13. ___ Both *Paenibacillus* larvae and *Melissococcus pluton* are gram-negative bacteria. (True or False)
14. ___ Two species of entomopathogenic fungi are

being tested as potential control agents against *Varroa* mites. These fungi attack their host by penetrating the mite's cuticle. (True or False)

15. Larvae are most susceptible to chalkbrood if they ingest spores when they are ___ days old and then are chilled briefly two days later
A. 5 to 6
B. 2 to 3
C. 3 to 4
D. 1 to 2
E. 4 to 5
16. ___ Terramycin is effective in killing American foulbrood spores found within the combs in the hive. (True or False)
17. ___ Mite-Away II is a new formulation of essential oils that is registered for the control of *Varroa* and tracheal mites. (True or False)
18. ___ Tylan (Tylosin) mixed with confectioners sugar will be used to treat colonies with American foulbrood. (True or False)
19. Name two potential dangers to beekeepers associated with the use of formic acid in the treatment of parasitic mites. (2 points)
20. Name five symptoms associated with parasitic mite syndrome. (5 points)

ANSWERS ARE ON NEXT PAGE

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?Do You Know? Answers

1. **False** The hatching of a honey bee egg is associated with a young larva producing a secretion that dissolves the chorion starting at the top of the egg and continuing downward toward the attached base.
2. **False** Drones that are produced from eggs laid by laying workers are smaller in size and likely less competitive during mating flights, but do produce viable sperm.
3. Alcohol
4. Carbon Dioxide
5. Acetic Acid
6. Water
7. **True** Summer female *Varroa* mites may enter brood cells up to seven times (not necessarily for successful reproduction every time) with the average lying between three and four reproductive attempts. Non breeding Winter mites live longer, up to nine months, but have fewer reproductive cycles in their old age by the following Spring.
8. **False** While honey bees may collect large quantities of pine pollen, nutritionally it is a poor source of pollen for honey bees.
9. **True** Tupelo honey is a product of the south and is produced by deciduous trees that are generally found in moist locations such as swamps, the margins of lakes and ponds, and along streams and rivers.
10. E) 30, C) 1
11. **True** In a worker cell the maximum number of eggs laid by a female *Varroa* mite is five, in drone cells up to seven eggs may be laid. The eggs are usually deposited on the cell wall, not on the larva itself.
12. E) Brown
13. **False** Both *Paenibacillus larvae* and *Melissococcus pluton* are gram-positive bacteria. The gram stain is a standard microbiological method.
14. **True** Recent research with several isolates of *Hirsutiella*

thompsonii and *Metarhizium anisopliae*, two species of entomopathogenic fungi, have found strains of both that were highly pathogenic to *Varroa* mites. These fungi do not have to be ingested to cause infection, but penetrates the mite's cuticle. These fungal pathogens do not cause any harm to honey bees.

15. C) 3 to 4
16. **False** Terramycin does not kill the spores that cause American foulbrood. This antibiotic prevents or delays spore growth when present in low concentrations in the food fed by workers to susceptible larvae. While this treatment allows individual larvae to survive, it does absolutely nothing about the virulent spores in the contaminated equipment.
17. **False** Mite-Away II is a pre-packaged, ready-to-use formic acid formulation that was recently approved in the United States for the control of both *Varroa* and tracheal mites. The sponge-like wafers contain formic acid and the wafer will be placed directly into the hive.
18. **True** Tylosin is expected to be approved in the near future for the treatment of colonies with American foulbrood. Preventive treatments will not be approved. Applications will be made by mixing the antibiotic with confectioners sugar and dusting the brood chamber. A four week withdrawal period will be required.
19. Burns to the skin can occur. Permanent lung damage can result from the inhalation of

- formic acid
20. Presence of *Varroa* mites
Tracheal mites may be present
Reduction in adult bee population
Evacuation of hive by crawling adult bees
Queen supersedure
Spotty brood pattern
Affected brood can vary from C-stage larva to prepupa
Individual larva may appear twisted in the cell
"molten" in the bottom of the cell
light brown, gray to black in color
watery to pasty consistency, resembling EFB, AFB, and sacbrood
Scales are not brittle and are easy to remove
No typical odor
No characteristic microflora

There 13 points in each test level this month. Check the table to see how 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	Grade
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.

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GLANNINGS

AUGUST, 2005 • ALL THE NEWS THAT FITS

AFRICANIZED BEES IN TEXAS, FLORIDA AND ARKANSAS

Crawling over and under boxcars, 18-wheelers, travel trailers and mobile homes. It's not what Paul Jackson expected in his duties as state inspector for the Texas Apiary Inspection Service.

But since 1990, those and many other unusual places have become common territory for Jackson and his team in their pursuit of the Africanized honey bee.

"We learned a lot about them and how they differ from the European or regular honey bees," Jackson said. "The process of quarantining counties where they were found enabled us to discover a lot of interesting points about these bees."

Jackson said because the bees are in more than 60% of the state, the apiary inspection service will no longer be quarantining counties. But the bee identification lab will continue to analyze samples to confirm counties where Africanized honey bees are detected. The latest detection, in Lynn County south of Lubbock, means 159 of the state's 254 counties have the bees.

When Africanized honey bees first arrived in Texas in October 1990, the state's officials quickly acted with U.S.D.A. officials to quarantine 10 counties surrounding the site near Hidalgo where the wild colony was discovered. After that, each time a sample was confirmed in a new area, that county would be quarantined.

Jackson noted that the quarantine meant that commercial bee operations could not move their hives to an Africanized honey bee-free county without first having samples taken to certify they were not contaminated with the more defensive bees. Commercial beekeepers paid for the service while the public at-large could send samples to the identification lab for free analysis.

"Among the benefits of the quarantine for the past 15 years is

that we showed that beekeepers were not the problem with the spread of AHB," Jackson said. "The quarantine proved that the spread of AHB in Texas is the result of natural migration of the insect."

After the bees were first detected in the United States (at the Texas location), they moved westward and have since been found in Arizona, California, Nevada, New Mexico and Oklahoma. No other state opted to quarantine their counties upon detection of the bees.

But Jackson believes the Texas effort provided a lot of information that researchers may continue to examine for years.

"Another thing we learned is that the AHB didn't migrate the way we expected them," he said. "They went north and west, while we originally thought they would go east."

The direction of migration, Jackson said, pointed out that the bees are subtropical in nature and desire semi-arid regions as opposed to the southeastern portion of the U.S. where it is generally wetter. Scientists and bee experts figured before their arrival that Africanized honey bees would need a constant flow of pollen and nectar, preferring warm, wet areas where flowers are almost constantly in bloom.

"They also hopped on railroad cars, 18-wheelers and all sorts of other modes of travel," Jackson said. "We had not experienced that before, with regular honey bees."

At one point, Jackson supervised four inspectors who traveled the state checking trap boxes that extended from Louisiana to New Mexico. He said one goal of that effort was to keep people informed about the location of Africanized honey bees, while teaching the public how to live safely around the new pest.

Though the apiary inspection service will no longer quarantine counties for Africanized honey bees, Jackson said, beekeepers still can use the lab to verify that their hives are not invaded by the bee, and the public still will be allowed to send samples for identification.

Information about the detection of Africanized honey bees in Texas will be updated at <http://honeybee.tamu.edu>

The big news in Florida is Africanized honey bees (AHB). Finds are increasing dramatically. Most are in the Tampa, FL area, but they are now popping up elsewhere as well, mostly south of Interstate 4. The Institute of Food and Agricultural Sciences Pest Alert pestalert.ifas.ufl.edu/ web page at the University of Florida provides relevant information (scroll down to see entries).

Besides that there have been reports of the bee in southwest Arkansas, and Texas agnews.tamu.edu/dailynews/stories/ENTO/Jun2205a.htm has decided to no longer quarantine honey bees in that state for being Africanized.

At a recent Florida Honey Bee Technical Council it was revealed that an AHB population appears to have built up over time, perhaps derived not from overland

migration, but rather from ships and perhaps through purposeful introductions. Apparently there have been no finds in beekeeping operations, only in traps managed by the Apiary inspection division, but it is expected this might change.

Some anecdotal information indicates an increase in swarming activity as well as defensiveness. The bottom line is that the state is on the verge of declaring a resident AHB population exists.

As this happens, there will necessarily be a shift in emphasis on both regulators' and educators' parts from denying Florida has AHB to educating both beekeepers and the general public about how the presence of these bees will change their lives. Beekeepers will have to understand that swarms will be changing in behavior. One of the biggest historical problems with AHB is that although swarms can be relatively non-defensive, the same swarm hived without any problems a few days before can become a defensive nightmare when subsequently manipulated. The general public must now become aware that severe stinging incidents are a possibility, but it should not panic. It is important to ensure that the general public be advised that tethered animals and the very young and old are at most risk.

From Apis Newsletter

PUMPKIN GUIDE RECOGNIZED

A groundbreaking resource about pumpkins was recognized with three awards in its first year of publication, as educators across the country are discovering its value to growers. *Pumpkin Production Guide* received awards from three organizations for being an outstanding extension publication for 2004. The American Society of Horticultural Science (ASHS), the American Society of Agricultural Engineers (ASAE), and the New

York State Association of County Agricultural Agents (NYSACAA) all selected *Pumpkin Production Guide* as a standout publication for the year. Published by NRAES (Natural Resource, Agriculture and Engineering Service) in June 2003, this comprehensive resource is now being used by growers and educators across the U.S.

This 152-page, easy-to-read guide, with color photos is available from *Bee Culture* for \$42.50

FIRE!

As things heat up, and dry out, we offer some links on fire and fire-fighting. You never know.

- Geo-Spatial Multi-Agency Coordination (GeoMAC) Wildland Fire Mapping Mapping tool, with data, for current wildland fires. www.geomac.gov/
- National Interagency Fire Center Woodland Fire Injuries and Fatalities www.nifc.gov/reports/
- National Fire Maps Maps of current wildland fire activity. www.nifc.gov/firemaps.html
- Current Fire Statistics Daily and year-to-date statistics by state, including number of fires and acreage. www.nifc.gov/fireinfo/nfn.html
- Wildland Fires www.nifc.gov/Text

Taken from Econdata.net

GRAD STUDENT SCHOLARSHIPS

The Foundation for the Preservation of Honey Bees, Inc. is a charitable research and education foundation sponsored by the American Beekeeping Federation, Inc. The ABF recently gave the Foundation a grant of \$50,000 from funds the ABF received from the estate of Glenn and Gertrude Overturf.

The Foundation Trustees have chosen to use a portion of the grant to offer five \$2,000 scholarships to graduate students in apiculture with the stipulation that a portion of the funds be used to attend the 2006 American Beekeeping Federation meeting in Louisville, Kentucky, to present their research. The Board of Trustees hopes that the scholarships will encourage young apicultural scientists and look forward to their

contributions to the 2006 ABF meeting.

Applications for the scholarships will be accepted until August 1, 2005.

Applicants should submit a cover letter from their advisor, a curriculum vitae and a research summary (not to exceed 3 pages) to the Board for consideration. The research summary can cover research completed within the past 12 months or proposed research that will be completed prior to the American Beekeeping Federation meeting. Recipients will be selected in September of 2005.

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

DROUGHT AID PACKAGE

The Australian government reminded beekeepers they are eligible for help under a A\$250-million drought aid package.

The worst drought since European settlement is deepening and some areas having been dry for four and five years.

Federal Agriculture Minister Warren Truss told the annual conference of the Victorian Apiarists' Association that producers often travel considerable distances to source honey and rely on areas that are Exceptional Circumstances (EC)-declared, even though they don't live in the area.

"Producers who make their living in areas currently covered by an EC declaration, which includes beekeeping, do have access to all the support measures in the package, where they can show they

have a right or interest to use land that is EC-declared," he said.

The aid package provides more than A\$250 million in additional assistance for farmers suffering from the drought on top of the A\$1 billion the Australian government already expects to spend on drought assistance to farmers.

It includes more generous interest rate subsidies with a revised assets test, a generous income test for relief payments and additional counseling and support services.

"I urge you to work closely with your state government and keep the lines of communication open to ensure all apiarists have the same access to this vital support," Truss said.

Low global honey prices coupled with drought-induced lower production are signaling

SUSTAINABLE AGRICULTURE GRANTS FOR FARMERS

The Northeast Region Sustainable Agriculture Research and Education program (SARE) has recently released the application materials for the 2006 Farmer/Grower grant program. These grants support Northeast farmers who want to explore innovative sustainable practices on their farms.

The Farmer/Grower Grant program allows farmers to conduct experiments, try new approaches, and test emerging ideas about agricultural sustainability. The emphasis is on new ideas that advance good stewardship, improve farm profitability, and strengthen rural communities.

In the 2005 grant round, awards ranged from \$2,186 to test whether certain cover crops improve soil health and yield in sweet corn to \$10,000 to evaluate the characteristics of different organic grains.

In all, Northeast SARE awarded \$138,803 to 24 farmers. The average grant was about \$5,800, and awards are capped at \$10,000.

To apply, you must be a full- or part-time commercial farmer in Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, West Virginia, Vermont, or Washington, DC Community farms and farms associated with a nonprofit institution may also apply, but only if they are growing and selling agricultural products under the same economic constraints that affect commercial growers.

The application can be downloaded from the Northeast SARE web site at www.uvm.edu/~nesare, or call 802.656.0471 or email nesare@uvm.edu for a copy. The deadline is December 6, 2005.

FAT BEES - SKINNY BEES

Australian research has found there may be a worthwhile alternative to moving apiaries further afield in search of brooding conditions.

Federal Agriculture Minister Warren Truss launched the publication, *Fat Bees-Skinny Bees*, at the Victorian Apiarists' Association's annual conference after work by the honey bee industry and the Rural Industries Research and Development Corporation.

Apiarists constantly move their honey bees around the countryside to satisfy the bees' nutritional requirements for normal growth and development.

"Bees - like human beings - need a balanced diet to maintain peak health and efficiency, Truss said. "In Australia's variable climate, bees face a significant challenge in gathering the range of foods necessary for the health of their colonies.

"*Fat Bees-Skinny Bees*, which

is a manual on honey bee nutrition for beekeepers, provides information on their known essential requirements, including the components of nectar and pollen.

"It provides practical guidance on preparing and feeding sugar and pollen supplements."

Truss says there is limited knowledge of pollen supplements but it's an area of great interest for those in the industry.

"Sugar syrup feeding is a commonly practised management tool in many countries but, so far, Tasmania is the only Australian state using it," he said.

The new publication provides information for beekeepers to seriously consider providing sugar syrup to bees to help manipulate bee behavior.

"As costs and returns of beekeeping change, the sugar syrup feeding option may provide an alternative to moving apiaries further afield in search of brooding conditions," Truss said.

tough times ahead for Australian beekeepers.

Infestations of the recently discovered small hive beetle are also hurting.

"The prices have declined well below half what they were at their peak," New South Wales Apiarists Association president Billy Weiss told ABC Radio.

"Increasing production means

there's still an oversupply in the world market to a degree. World prices are depressed, and Australian prices have reflected that.

"It's quite a stressful period for beekeepers because we probably are entering a low production period with bees in bad conditions, and a low commodity price, which makes it difficult to sustain our business."

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When Pitkin County Commissioner Mike Owsley asked if I'd pick up a half-dozen nucs at my neighbor Paul's and drop them off at Woody Creek, I said "Sure." I was going that way anyway.

The Owsleys and I go way back. Thirty years ago when we were neighbors in Leadville, I'd leave my dog with Ann while Mike and I drove to work together. Later, I lived in a shepherd's wagon on their Woody Creek property, up by Aspen. They never charged me rent. They had me over for supper a lot.

Today I live 50 miles from Woody Creek, but this Spring I had bees next to the Aspen airport. Mike and Ann's seven-acre spread was practically right on the way.

Until a few months ago, "gonzo" journalist Hunter S. Thompson lived at the other end of Mike's driveway. It might sound like I'm namedropping. I just want to give you an idea of the neighborhood. But Woody Creek is fairly understated, for Aspen. This is rural. They aren't all monster homes.

Mike's had bees practically as long as I can remember. But they generally don't make it through the Winter, and every Spring he buys nucs. Mike doesn't take any of this too seriously. At his daughter's wedding reception at their place a couple of years ago, he caught me heading over to the bees. "Don't go there," he said. "It's too depressing. I never got the bees out of the nuc boxes, and they all swarmed."

The morning I dropped off his bees, Mike said, "I've got some frames you can have," but they turned out to be unassembled wooden frames, and I politely declined his offer. I came to beekeeping only a decade ago, and I'm a confirmed molded-plastic frame guy. I've never assembled a wooden frame. I've repaired a few. I suppose nailing frames would make a pleasant pastime for someone with time on his hands, but that's not me.

Mike and I chewed the fat some, like old friends do, and it was late in the morning when I finally arrived at my Aspen yard. Looking north from the hives, dandelions carpeted the meadow golden as far as the eye could see. I went right to work making nucs.

After a time, I heard a roar, sort of. Bees streamed out of the hive next to the one I was working, but it wasn't quite that jet-taking-off roar you associate with swarming. I think maybe this was because bees had to exit through a pollen trap, and they couldn't get out fast enough to all take off at once.

I couldn't tell where they went. They were flying everywhere and seemingly not headed anywhere in particular, so I just went back to work. There's just so much time I can spend chasing swarms. It was maybe a half-hour later that I noticed a cluster of bees hanging on an alder. I tried to bend the tree so I could shake the little darlings into a super, but the trunk was too stout. Undeterred, I put a comb of honey in a bucket and used a stick to hang it onto a limb next to the swarm. When the bees started heading into the bucket I thought, "Perfect," and went back to making nucs.

Pretty soon I noticed a steady stream of bees heading back into the hive that had swarmed. I thought, "That's weird," but I didn't really think too much about it. There's a lot I don't understand about bees.

After I made my nucs, I plugged the nuc boxes and loaded them into my pickup. I was in something of a rush because I had to pick up Spot at the vet's 40 miles away in Glenwood, and they close at four. I had to deliver some honey in Carbondale on the way.

When I went over to collect my swarm - to my astonishment the bees were gone. Maybe they all went back to their old hive. Maybe the queen had stayed behind. You never know.

Headed down the highway I noticed bees leaking out the back of my truck. I stopped and threw some netting over them, but I had so much junk in the truck bed that I didn't do a very good job. I didn't have time to do a very good job. Not if I was going to deliver honey and get to the vet's by 4.

Predictably, in Carbondale I got stuck in traffic. I was still losing bees. People stared, but nobody screamed or got stung.

I missed a turn looking for my honey customer's house. When I finally found the street, I realized I'd neglected to write down the number, so I just started knocking on doors. I found him on the fifth knock.

At the vet's office in Glenwood I parked in the alley. A woman with a Chihuahua and one with a Pomeranian were ahead of me. The receptionist was explaining a bill to the woman with the Chihuahua when I interrupted. "Excuse me," I said, "but I have a problem nobody else in this room has." That was a conversation stopper.

The receptionist eyed me closely. "What kind of a problem?" she said.

"I'm leaking bees out of my truck," I said. "Could I pick up Spot and run?"

"Leaking bees. Oh my," said the woman with the Pomeranian. "You do have a problem nobody else has."

The receptionist laughed and said, "Didn't she tell you? Your wife picked up Spot two hours ago."

Ed Colby

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