Bee Culture

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

APRIL 2002 VOLUME 130 NUMBER 4

FEATURES

The perfect swarm. Many will be around this month and next.
photo by Kim Flottum

DEPARTMENTS & COLUMNS

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KEEP IN TOUCH

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MAILBOX

Coffee - No Problem

I was surprised to read Jim Lowe's letter (November 2001). For many years, we had one of those wonderful little coffee shops where they roast and grind the coffee on the premises here in Stratford-upon-Avon. The raw beans came in burlap sacks and these were my sole source of smoker fuel for many years, giving an excellent cool smoke with a faint aroma of coffee. I can honestly say that I never found that this smoke produced aggression in the bees.

They were also easy to roll up and cut into suitable size pieces with a sharp bread knife – and could be lit without the need for paper. Unfortunately the shop closed and so I now use wood from the many stumps of the elm trees that were destroyed a few years ago by Dutch Elm Disease.

I think that the coffee sacks were best, but wood smoke is very pleasant. The elms have now rotted to the point where they are very light and porous like balsa wood (punk wood) and so are very easy to light. The only problem with using this wood is fine ash, so I always put handful of green grass on top of it to act as a filter. With the sacks this was not necessary, because as one 'cartridge' burnt away, you could put another on top – keeping the ash at the bottom.

Peter Edwards
Stratford-upon-Avon, U.K.

Sitting In A Puddle

I find myself out in the weeds with all the other beekeepers sitting in a puddle of bathwater wandering what happened. Sunday night baths just aren't what they used to be. Were we overlooked our do they just not care about us anymore?

First our state apiary program, along with many others disappeared. No more inspections, no extension service, and no more pollination regulation. We in Washington State however still have the privilege of paying registration fees for no apparent service but let me not digress. Next we hear that the federal government wishes to drastically reduce funding at the ARS and eliminate all but one of our bee research labs. Pioneers and luminaries in bee research are retiring it seems monthly and in some cases prematurely for what I guess to be financial reasons. While I applaud the fine work of many university based researchers there is an unmistaken trend in this country toward less and less public funding in all agricultural areas including beekeeping. Within the industry deep differences of opinion will have, I fear, eliminated the National Honey Board and its meager honey research funding. The economic conditions in beekeeping are dismal and staying afloat is rightly the highest priority of most beekeepers.

At the same time our need for research has never been greater. Resistant mites, resistant foulbrood, small hive beetle, and extreme winter loss are exacting heavy tolls on many beekeepers at all levels. Chemical inputs are costly and short-lived encouraging some to look for shortcuts without knowledge of their long-term impact. What do we do now? There are many small and fragmented research funds and endowments around the country in many cases duplicating the efforts of others. Major universities are doing good work, but how much co-ordination is there? I look to the excellent example of our neighbors in Canada and their Canadian Research Fund and see a fine example of how beekeepers and industry can work together to create and manage an endowment by and for the good of the industry. We can't say it won't work because it is working there. Perhaps we could encourage them to expand and include all of North America or even more, who knows?

I am not and can not speak for others but I do respectfully encourage leaders of our national beekeeping organizations, honey industry members, and university research labs to look to the future and see what we can do collectively to better the industry. I feel that we should support a research endowment with focused goals and the proven ability to select worthy projects and administer grants. Further it is important that the results of such research reach a broad audience in the beekeeping industry. Alas the bathwater has been tossed out and all of us along with it, so dry yourself off and start thinking of where we go from here.

Paul Hosticka
Kingston WA

Bees Hit The Wall

I am currently re-decorating my breakfast room, which has an observation hive, with a flight tube. There is wallpaper I want to replace to brighten up my little niche. So, I visited the American Blind & Wallpaper website (www.decoratetoday.com) and did a search on keyword "beehive" under 'Wallpaper and Borders.' And WOW, having bees for 21 years now, I was in paradise. I wonder if this would "BEE" of interest to your readers?

There is a toll free number, 800.575.8016, for beekeepers that aren't with computers. Also, I was able to order samples for a nominal fee.

I've been taking *Bee Culture* since my beginning in apiculture. Keep up the good work.

Ken Woodard
Chesterfield County, VA

Continued on Next Page

MAILBOX

Working Together

A letter from Pat Heitkam, President of ABF to Lyle Johnston, President of the AHPA.

Congratulations on your election as President of the AHPA. I'm both honored and overwhelmed with my new position as ABF President. Honored that my fellow beekeepers intrusted me with this job. I'm overwhelmed by the responsibility that it carries. I am going to do my best to live up to those trusts and responsibilities, as I'm sure you will.

Our organizations have many differences when it comes to philosophy as well as goals. However, I know we have many goals and philosophies in common. I believe our challenge is to identify our common goals, find compromise where possible, and pursue those goals on a cooperative basis.

Last year we identified one of those goals. We compromised, we cooperated and we were successful. I'm referring to the Farm Bill. Our final goal has yet to be realized but our successes were stunning. We were placed in the House Farm Bill without the usual dissention. We are in all of the existing proposed Senate Farm Bills. I heard the comment more than once, "We are happy to see both organizations working together. It makes our job much easier." Our success in Congress was due to our ability to educate. Understanding will lead to the recognition of our tremendous value to agriculture as well as the environment. Another success was the ability of our lobbyists to coordinate and cooperate. Fran Boyd and John Waits have their individual contacts and together they made a powerful team. My thanks to you and your organization for your cooperation in this effort.

Another issue we might try to tackle is the conflict for our members, as well as our vendors, pertaining to our convention. Steve Park has been in the lead on this for some time. Many members of both organizations feel the need to be free of convention commitment by mid January. Some possible solutions to the dilemma may be:

1. Rotate early and late conventions between AHPA & ABF.
2. Same city, adjacent dates.
3. Same hotel, adjacent dates.
4. Same hotel, overlapping dates (with joint trade show).

The goals would be to consider the wishes of both our memberships to be finished with conventions by mid January and not force vendors to make a choice to attend one convention or another. It's clear that they desire to woo both memberships. Possible benefit may be a less cumbersome, more enjoyable, less expensive experience for our vendors, larger audience and less expense for our speakers, and progress toward my goal of cooperation and communication. My suggestion would be to form a group of perhaps two ABF members, two AHPA members, two vendors, and Kim Flottum to investigate various options.

Yet another issue

Some of our board met with the NHPDA and they asked us to support moving the Honey Board from the fruit and vegetable division of AMS to livestock. They felt that oversight cost would be significantly reduced if this were accomplished. They also said that AHPA was in support of the change. If this is correct I might suggest the use of our lobbyists in this endeavor. If you're not in support of the change please advise me ASAP.

A suggestion at the Honey Board round table was for us to copy both sets of board members when we communicate. I will be doing that. Because of the size of our board I will gladly share your communication if it will make your life easier.

Lyle, I'll make these promises to you:

1. I won't ever knowingly tell you an untruth.
2. I'll make every attempt to keep my word if we enter into an agreement.
3. I'll always strive for fairness.

I look forward to working with you.

Pat Heitkam
Orland, CA

Misuse of Strips

I am writing to inform you of recent concerns communicated to us by state and federal regulatory agencies regarding beekeepers not following label directions with the use of CheckMite+ Beehive Pest Control Strips. Bayer Corp, USDA, and beekeepers in many states have worked together to request and obtain the Section 18 Emergency Exemptions. The exemptions temporarily provide beekeepers with an effective treatment for hives infested with *Varroa* mites and/or African Hive Beetles.

The concerns are that CheckMite+ strips are being misused and label directions for the product are not being followed. There are reports that the strips are used during honey flow, strips are either removed from the hive prior to the time interval required to provide optimal mite control, or strips are left in the hive for intervals longer than specified on the label. There are also reports of using a fewer number of strips per hive than indicated with the labeling. Misuse of the strips by not following the label instructions

MAILBOX

may result in exposing mites or beetles to sub lethal concentrations of active ingredient. Based on experience with other products, sub lethal dosing speeds up the *Varroa* mite's ability to become resistant to the product.

Currently each state yearly must request the use of CheckMite+ Strips from the United States Environmental Protection Agency under a Section 18 exemption. The request can either be denied by EPA or not submitted by the states. Also, EPA or a state can cancel the Section 18s at any time.

Bayer will be submitting a complete CheckMite+ registration package for EPA's review soon. Once the full registration package is reviewed and accepted by EPA, Section 18 state authorizations will be eliminated. Registration of CheckMite+ by EPA is not certain, especially if it is suspected that the product is not being used according to label directions.

We at Bayer are confident that when used as labeled, CheckMite+ Strips can provide excellent control of *Varroa* mites and hive beetles for many years. The loss of the product at this time would severely limit the options available to beekeepers for effective pest control and resistance management.

Numerous state apiary experts, individuals from the USDA, and representatives from the bee industry have worked in cooperation with Bayer to make these strips available to the bee industry.

Please assist your industry by using CheckMite+ according to label directions. Keep CheckMite+ a viable product for beekeepers for as long as possible.

Richard Hack
Bayer Corporation Product Mgr.

Wise Guy, My Favorite

Except for Mullah Abdullah in the "Uzbeki Bee Fatwa," I think the Wise Guy has to be my favorite commun err columnist. Do I have his points right from his February missal?

1. Constantly enforce the following laws and vigorously punish with fines or imprisonment.
2. Labels should be printed according to rules based on color, floral source and other (?) characteristics.
3. Country of origin printed as large as the word "Honey" on all labels.
4. Reserve the term "Grade A fancy" for American honey. All American honey is Grade A fancy. All foreign honey is well foreign, and I don't want foreign stuff in my honey.
5. No blending of honeys. Period. ("What are you in for?" "My bees mixed some knotweed into my clover and I got a surprise visit from K-G-Bee committee.")
6. Foreign honey is equivalent to corn syrup and should be used accordingly.
7. Out of respect to women, all female beekeepers are required to wear burka style beesuits.
8. Honey producers are responsible for funding the implementation and enforcement of the above laws.

Welcome to the brave new world of the People's Democratic Republic of Amerikstan. Multiply these rules by every self-interest group in the nation and everyone will be in jail. How thin and fragile is the veneer of freedom.

Peter Sieling
Bath, NY

Math/Science - Fun

Thank you for the interesting article "Be A Budding Genius, Not A Blooming Idiot" in the February 2002 issue. I found it quite intriguing and plan to use it as a science/math project for my two sixth grade homeschoolers. They will use the math to calculate degree days and then keep close track of what is in bloom during their science expeditions outdoors.

I made a simple chart on the computer for them to keep track of their progress and made it available for anyone else who would like to use it. Got to http://www.emeraldridgeapiary.net and click on the "Degree Day" link. To print out the chart just hit the "Print Page" button.

James Littley
Mt. Pleasant, MI

Trap or Shoot Them

First we were invaded by Africanized bees from Pretoria, next by the South African hive Beetle, now we are threatened by the Cape Bee, and lastly we are informed of the emergence of "bear-breasted females" (see Apimondia, Feb. issue). Should the latter reach our shores, do we trap them, shoot them, or can they be controlled with electric fencing?

Bob Fullerton
Babb, MT

INNER COVER

Let's say there's a company in Ohio that makes red, white and blue widgets. Because of the fixed costs of taxes, labor and whatnot, the lowest cost it can make those widgets for is $1.00 each out the door. No matter how efficient that company is, no matter how many perks the city fathers give that company, no matter that there is no union or oppressive environmental restrictions, it can't produce them any cheaper than $1.00 each.

Then, a company in China notices the product, and after evaluating the market decides this is something it can profitably produce in one of their factories. Profitably produce including production costs, tariffs, shipping and distribution. They can, in fact, deliver them for $0.75 each to their customer's door in the U.S. The same customers that the Ohio company was serving. And, those customers have little incentive to worry about anything except price...all other things being about equal.

So the Chinese manufacturer's rep approaches these same customers with an offer. And the customers are inclined to switch suppliers because of price.

Competition being what it is, an industrious accountant at the Ohio factory looks into the possibility of moving the manufacturing facility from Ohio to Mexico. There the fixed costs are significantly lower, and, indeed, with his company's production efficiency, their established distribution routes and whatnot, can, in fact, produce the same red, white and blue widget for $0.60 each, delivered to the customer. This, even considering they are using the same raw material suppliers from the states.

They make the move (laying off several hundred workers in Ohio and abandoning the plant, the taxes to the schools and charitable contributions they had been making to the community) and set up shop in a border town in Mexico. They continue making widgets, using local labor, and working under a different set of environmental rules. Moreover, they don't have to pay taxes to any U.S. agency, thus not supporting the overall welfare of their former country.

I ask you, is the red, white and blue widget they produce in Mexico an American product? The profits go to the American company. The company is still owned by an American enterprise. But it's produced by Mexican labor on Mexican soil, under Mexican rules and regulations.

Now, change the scene a bit. Imagine that an equally industrious accountant in China, working for an exporting company specializing in honey, looks to America, does the math and concludes that if they owned a packing plant in the U.S., they could export bulk Chinese honey and bottle it there in consumer packs, or any container their customers wanted in a plant they owned, if they owned one. If they did, they could make a significant profit because they have eliminated the middleman here in the states. Even considering tariffs, shipping, local taxes and all the rest, they could still sell their honey cheaper than domestically produced honey in the same containers. Is the honey an American product? They pay American taxes, produce under American rules and regulations, support local charities and all the rest, but the profits go back to China.

What do the labels on those two products say, relative to Made In.....? Who benefits from the move?

If it hasn't already happened, it will. Car manufacturers make cars here in factories owned by foreign companies. Are they Made In America? Are they American cars? Will this be American honey?

Will you see on a honey label Bottled In America? Produced For An American Company? Who will know what's in the bottle? Like the red, white and blue widget, will anybody care, as long as the price is right? Does Wal-Mart win?

Not to belabor this subject, but ladybugs have risen to the top of my attention again lately. Last fall they entered my entryway by the thousands. They made their way into the house and I have been dealing with them all winter. In the sink, in the bathroom, on the floor, buzzing the lamps at night, in the cat's water dish, on my toothbrush, falling in my supper, even walking on the computer screen as I type this. They have been a nuisance all winter long. No, more than that. They have been a severe pain in the.... Well, revenge is sweet, if not Christian, and this spring their chosen lifestyle has been their undoing. Cold weather in the entryway, low humidity in the house and other factors I do not understand have combined to cause the early demise of many of them. Very, very many of them. They have been dying in drifts in the entryway for a couple of weeks now, rolling over dead on the kitchen counter, living room floor, bathroom counter and every window ledge I have. Paper bags full have succumbed to what ever it is that's killing them.

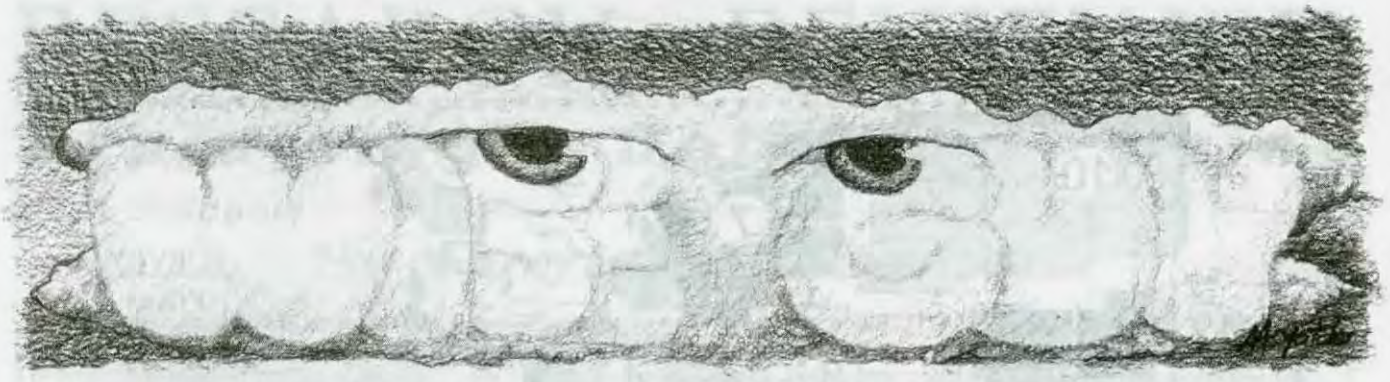
I do not delight in the death of any living thing. But there comes a point when it's me or them. Well, I didn't make anything happen that made it be them, but I don't mind sweeping, cleaning and picking up dead ladybugs in my house. I imagine there will be millions of aphids who will not be eaten this summer because these predators in my house didn't make it through to summer. But natural selection being what it is, these lady bugs have not lived to reproduce and there will be fewer of their kin inclined to seek my house next year as an overwintering place. Those who found hollow logs and other outdoor places of winter protection that have lived will produce offspring this year with a ken for those places, and not my living room. That's a good thing in my mind.

It's April now, and every beekeeper worth his or her smoker has it lit and their hive tools sharp. It will be dry in the east, wet in the middle and who knows out west. Keep a sharp eye for resistant pests, and Chinese honey bottled in the U.S.

Kim Flottum

Made In The U.S.A.

Lady Bug, Lady Bug .. die.



Value added. Value added. What does that mean to you? What is value to you? If you purchase a new vehicle do you always buy the cheapest? Vehicle brands – do they matter to you or again is it only price? If you purchased a milk cow would you only look for two eyes, horn, four legs and a place to put the milking machine? When your children are going to school do you tell them to only do good enough to get Cs because that is average and that is all you need to get by in this world?

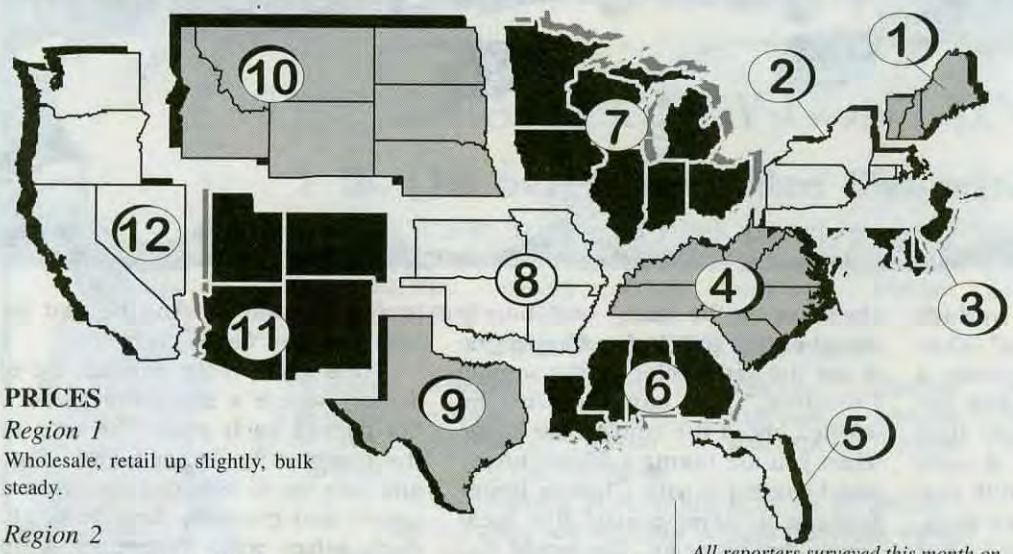
Average. Value added. Where to those two ideas cross? Or should I say how can these two ideas cross? Or should I say how can we "bond" these two ideas together? I wonder if we should throw "maintain the wholesome image of honey" into that mix also. Back in late 2000 the National Honey Board had a Industry Round Table and the #1 item on the agenda after two days was maintain the wholesome image of honey. Now that statement appears to top a list of fibs only to be out done by "the check is in the mail" and barely ahead of "the honey you shipped me is not the same color as the sample I received." How can you truly be worried about the wholesome image when you are taking a 25mm honey and blending it with Chinese honey that has a "flavor profile" that most people don't care for. The words *Flavor Profile* were used in written testimony to explain why no one uses straight Chinese honey. It appears the words "flavor profile" mean bad taste in English. I believe in honey marketing language "flavor profile" means higher profit.

Now value added, what does that mean to you? To most people it means making a product better by adding a service or better product to an existing product, by adding value. Or it may even mean to further refine a product and turn out a better product. Are any of our honey marketers adding value by blending cheap honey with better honey? Are they "adding value" by changing the "flavor profile" or are they adding to their bottom line. Is the wholesome image of honey being helped by blending the "flavor profile?"

This whole thing reminds me of a story where a small town had a pet parade each year. The kids of the community dressed their dogs and cats up to look like clowns and people and generally tried to outdo each other with costumes. One small boy who lived on the edge of town had no dogs or cats. They only had pigs. He wanted to be in that parade but his father said no dogs or cats on the place. So the little boy convinced his mom and dad to help him dress up his favorite little pig. They worked for days to sew a clown suit with a hat and other frills. The costume was bright and looked great. On the day of the parade he took his pig and lead it into the staging area with all the other pets. The young boy looked at all the cats and dogs dressed up and prancing around. He looked down at his pet and then with a long face looked up at his dad and said "No matter how you dress it up it's still a pig."

Wise Guy

APRIL – REGIONAL HONEY PRICE REPORT



SURVEY
Prices
Stocks
Buying
Containers

PRICES

Region 1
Wholesale, retail up slightly, bulk steady.

Region 2
Prices steady across the board.

Region 3
Bulk prices up, all others steady.

Region 4
Wholesale, retail prices up, bulk steady.

Region 5
Retail and wholesale prices up, bulk steady.

Region 6
Bulk and retail prices up a bit, the rest steady.

Region 7
Retail up, the rest steady since last month.

Region 8
Bulk and pails up, the rest steady.

Region 9
Retail steady, everything else up.

Region 10
Bulk and wholesale steady, pails and retail up.

Region 11
Wholesale up, the rest steady since last month.

Region 12
Pails down, retail steady, wholesale and bulk up.

All reporters surveyed this month on remaining stocks, buying and reselling honey, and container use.

Remaining Stocks
1. Extra left when this year's crop comes in – 42%
2. Already sold it all – 19%
3. Will run out soon – 20%
4. May have to buy some to fill in – 16%
5. Only use what I make – 4%

Buying
Fully 36% DO NOT buy honey to resell, of the rest…
6. 31% only buy local honey
7. 8% buy vairietal honeys from several sources and sell as is
8. 6% blend to meet customer's expectations
9. 26% seldom, if ever buy

CONTAINERS

A variety of containers are used…

Plastics
10. Bears – 66%
11. Tubes – 9%
12. Bottles – 49%
13. Angel – 6%
14. Bee – 5%
15. Other (skeps, etc.) – 14%

Glass
16. Standard queenline – 34%
17. Gamber Classic – 15%
18. Mason jars – 52%
19. Hex/fancy – 15%
20. Other glass – 24%

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
60# Light (retail)	77.00	76.80	74.00	72.70	75.00	72.50	62.50	66.20	90.00	72.83	85.25	62.50	62.50-90.00	73.94	71.51	70.42
60# Amber (retail)	73.50	69.39	68.00	71.60	65.00	67.33	62.80	60.00	86.67	60.67	78.40	45.00	45.00-86.67	67.36	67.92	65.82
55 gal. Light	0.72	0.75	0.72	0.63	0.65	0.74	0.76	0.78	0.60	0.74	0.69	0.72	0.60-0.78	0.71	0.73	0.62
55 gal. Amber	0.63	0.65	0.69	0.60	0.63	0.71	0.70	0.69	0.69	0.68	0.64	0.69	0.60-0.71	0.66	0.66	0.58
Wholesale - Case Lots																
1/2# 24's	31.52	27.59	31.30	34.01	31.30	30.00	29.04	31.30	30.00	27.91	23.00	35.30	23.00-35.30	30.19	29.07	29.08
1# 24's	50.22	41.68	48.00	45.01	42.47	41.50	38.71	45.30	42.93	46.57	46.50	50.07	38.71-50.22	44.91	45.46	43.53
2# 12's	45.73	38.87	46.80	43.72	44.50	40.00	37.45	41.57	39.88	36.40	45.00	41.00	36.40-46.80	41.74	40.88	40.03
12 oz. Plas. 24's	41.05	36.23	45.60	35.62	35.00	42.00	34.66	36.01	34.80	38.45	37.50	39.87	34.66-45.60	38.06	36.99	37.09
5# 6's	48.81	42.92	57.00	46.05	47.86	45.00	40.15	39.00	45.10	39.00	50.00	36.00	36.00-57.00	44.74	42.87	42.20
Retail Honey Prices																
1/2#	1.94	1.65	2.01	2.03	1.49	1.75	1.62	1.77	1.73	1.91	2.53	2.19	1.49-2.53	1.88	1.81	1.79
12 oz. Plastic	2.58	2.13	2.95	2.41	2.50	2.74	1.96	2.30	2.39	2.37	2.81	2.41	1.96-2.95	2.46	2.35	2.35
1 lb. Glass	3.07	2.36	3.00	3.21	2.67	3.09	2.38	2.70	3.56	3.21	3.65	2.80	2.36-3.65	2.98	2.93	2.77
2 lb. Glass	5.39	3.85	4.80	5.38	4.37	4.89	4.11	4.69	5.00	4.26	4.31	4.80	3.85-5.39	4.65	4.41	4.59
3 lb. Glass	6.25	6.08	7.80	6.90	5.20	6.50	5.15	6.29	6.67	6.71	6.36	5.99	5.15-7.80	6.32	6.33	6.35
4 lb. Glass	9.00	6.60	8.83	8.89	8.83	8.50	8.30	8.17	8.25	8.50	10.00	8.00	6.60-10.00	8.49	8.09	7.73
5 lb. Glass	11.46	8.88	11.00	10.48	9.00	11.25	8.77	10.53	8.25	10.16	8.99	8.95	8.25-11.46	9.81	9.92	9.69
1# Cream	3.75	3.09	4.15	3.71	4.15	3.42	3.19	2.87	4.15	3.62	4.43	3.05	2.87-4.43	3.63	3.73	3.40
1# Comb	4.23	3.80	3.60	4.58	4.92	4.17	4.11	4.01	4.92	4.35	5.50	4.50	3.60-5.50	4.39	4.42	4.46
Round Plastic	4.43	2.94	3.60	4.00	4.01	3.75	3.90	3.74	4.01	5.00	5.10	3.85	2.94-5.10	4.03	3.64	3.56
Wax (Light)	2.11	2.18	2.00	1.79	1.00	2.50	2.36	2.50	2.50	2.00	2.03	2.00	1.00-2.50	1.58	1.63	2.44
Wax (Dark)	1.50	1.49	1.75	1.63	0.90	1.33	1.21	1.57	2.00	2.57	1.93	1.75	0.90-3.00	1.39	1.37	2.24
Poll. Fee/Col.	38.86	41.33	40.00	36.50	27.50	40.00	38.50	40.00	24.33	37.54	43.50	44.50	24.33-44.50	37.71	38.53	39.05

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

"How do honey bees resist tracheal mites?"

The notion that honey bees can exhibit resistance to tracheal mites is not a new one. In fact, the history of the tracheal mite in Europe provides a lesson for those of us in North America. Following the discovery of the mites in bees collected from the Isle of Wight, tracheal mites were found in and spread throughout continental Europe with devastating results in the 1920's. At the time, an extensive literature developed on chemical and cultural control methods for these mites and the associated "crawling disease" However, within a decade or two, interest in tracheal mites in Europe (as reflected by the number of reports in the scientific literature) diminished. Tracheal mites no longer seemed to be much of problem for beekeepers in Europe. Why? Could it be that the surviving honey bees had become resistant to tracheal mites?

Evidence for this may be gleaned from some interesting observations published by Brother Adam (1968). In 1924, he obtained honey bee queens from the U.S. "of a bright golden colour" and placed them in colonies in his apiary at Buckfast Abbey in Devon, England. In 1925 he raised a large number of daughter queens from these and also imported more US queens. His conclusion by 1926 was "the American strain gave full satisfaction in every way but one: it proved highly susceptible to acarine disease" (tracheal mites). Brother Adam continued for many decades to breed for honey bees that survived tracheal mites without chemical treatment and in 1958 imported 2 more queens from the U.S. of the same strain tested in 1924-26 "primarily to ascertain whether this strain was still as susceptible to acarine" Within two years, both colonies had collapsed with symptoms of crawling disease. An examination of 20 of the crawling bees from one colony revealed that "every bee was heavily infested with acarine"

The extent of the susceptibility of US honey bee stocks became truly evident soon after the discovery of tracheal mites into the U.S. in the mid-1980's. Massive colony losses were reported, with dwindling and loss often occurring in the early spring. Almost 2 decades after the introduction of tracheal mites into the U.S., it is reasonable to suggest that the extent of the problem has lessened somewhat, perhaps due to an overall increase in mite resistance among surviving U.S. stocks. It is now possible to purchase commercial strains of honey bees that are genetically "resistant" to tracheal mites. The question arises – how are such bees actually "resistant" to the damaging effects of tracheal mites? In this month's column – we take a look at several scientific papers that shed light on some of the mechanisms that contribute to honey bee resistance to tracheal mites.

In the first of these, Pettis and Pankiw (1998) conducted a series of experiments, using both full-sized and observation hives, and found a correlation between mite prevalence (% of bees with mites) and allogrooming (one bee grooming another individual) and the number of "grooming dances" performed. The researchers found that young worker bees that exhibited the highest levels of dancing behavior acquired the fewest tracheal mites. They attributed the reduced number of mites found in these dancing bees to "autogrooming" (the raking action of a bee's legs over its own thorax) that occurs as part of the grooming dance.

Danka and Villa (1998) reached similar conclusions based on a set of experiments using tracheal mite resistant and susceptible lines of honey bees. The authors amputated various leg segments from individual young worker bees and then assayed their infestation level following exposure to a colony or cage of mite-infested honey bees. Using various combinations of amputating one, two or a portion of the mesothoracic leg(s) (the middle pair) the authors were able to determine that these legs were important in the ability of resistant stocks to remain free of tracheal mites. Together with the Pettis and Pankiw study, Danka and Villa put forth strong evidence for the role of auto-grooming as an important genetically-based mechanism of tracheal mite resistance.

Another proposed mechanism that may allow bees to resist becoming infested with tracheal mites is the physical barrier represented by "guard" hairs surrounding the opening to the tracheae themselves. In a short scientific note, Danka and Villa (1999) reported the results of a series of "shaving experiments" performed on young bees of both resistant and susceptible lines of honey bees. In these experiments the researchers trimmed off the hairs (known as paravestibular hairs) from one side of individual young honey bees. The untrimmed side of the same bees served as a control. The bees were then exposed to mite-infested colonies for 4 days. The results showed that there was some increase in mite infestation on the trimmed side of the bees compared to the untrimmed side. The author's concluded that these hairs thus "normally deter some tracheal mites...from entering the spiracles." However, there were no differences in the response to trimming hairs between the resistant and susceptible honey bee stocks. They explain that "if hairs accounted for the genetic resistance of (the resistant bees), then removing hairs should have caused a relatively larger (% of bees with mites) increase in these bees than in susceptible bees..." Since this was not the case, they consider autogrooming (as shown in the earlier studies) to be the mechanism of primary importance in the resistance.

While these studies certainly do not rule out other mechanisms by which bees may be resistant to tracheal mites – they do present evidence that a genetically based behavioral trait may be quite important in conferring tracheal mite resistance in particular honey bee stocks. BC

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Mark Winston

Surprised

"It's not that writers know more things than other people, or understand more things than other people, but that they are surprised by more things than other people."

Regular readers of this column know that I am an intemperate collector of quotes. I respect the occasional achievement of verbal perfection embodied in those rare phrases that jump out of their pages. Moreover, the reflective thoughts contained within somebody else's telling words often stimulate my own thinking far beyond the intended message.

A quote by the highly regarded Canadian author Alice Munro came to mind during a flurry of seemingly unconnected discussions I had with colleagues about bee research. Munro was being interviewed by Peter Gzowski, a legendary radio host and writer here in Canada, for our national newspaper *The Globe and Mail*. He asked her what distinguishes writers, and she replied "

it's not that writers know more things than other people, or understand more things than other people, but that they are surprised by more things than other people."

I recalled this quote because of my intense surprise at a series of conversations, e-mail messages, and observations that came to my attention during four days in San Diego. I was attending the Entomological Society of America (ESA) meetings along with 2500 or so other scientists who study insects, and was startled by the low morale and concerned dispositions of my colleagues who study bees.

Their concerns had tangible origins, based in problems funding basic and applied bee research, possible loss of university and government research jobs relating to bees, and an erosion of the extension and regulatory capacity in the United States. The end result has been reduced capacity to conduct innovative research and transfer findings into commercially viable practical applications.

Less tangible but as troubling was their sense that the national objectives of bee research have become diffuse and unfocussed, with a corresponding reluctance by government and universities to support a community perceived as drifting. The conduct of both long-term, basic studies and short-term practical applied research is critical to our industry's health and survival, but may be compromised by the lack of a communal vision concerning what bee research should be accomplishing.

The first and perhaps most disturbing sign that all is not well with the American research community was the student talks, or rather the lack of them. The Entomological Society hosts student competitions each year, in which students present their work in 12-minute talks, and an award is given for the best talk in each section. These competitions attract many of the best and brightest entomology students in North America, and the talks are impressive for their high quality, originality, passion, and range of basic to applied studies.

This year, there were only seven bee talks scheduled in the Apiculture and Social Insects student competition, and four of those were from my own Canadian students. The dearth of young American apiculturists reporting studies about bee biology and management at the traditional ESA venue should be a serious concern for the U.S. beekeeping community, because it foreshadows an upcoming gap in our ability to meet future research needs.

A second tangible and troubling sign of an impending crisis were concerns whispered to me in hallways that administrators at a few U.S. universities have become disillusioned with bee research. They view it as difficult to fund, perceive some of the current researchers as being unsuccessful at attracting large government grants, and consider the beekeeping industry itself as being a fractious and unsupportive commodity group. Whether correct or not, this perception could lead to the loss of faculty positions in bee research at U.S. universities over the next few years as faculty retire or leave for other reasons.

A third indicator of the malaise that has settled over the beekeeping research community were the numerous tales I heard about funding problems. This appeared to be the classic rock-and-hard-place phenomenon, with basic research suffering from the perception that bees are not important enough, while applied research suffers from the preference by university administrators for faculty who do basic research.

A good example of the problems

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encountered when seeking funding for basic bee research is the ongoing attempt to promote the honey bee as a candidate for a full-scale genome project to sequence every gene in the bee. This project is being spearheaded by Gene Robinson of the University of Illinois, and has the support of many beekeeping organizations including the Texas and California state associations and the National Honey Board.

The benefits to beekeeping are admittedly long-term, but knowing the entire genome of honey bees might create possibilities for improving selection of bee stock and developing new and highly specific disease and pest treatments. The price tag would be about $7 million, and amazingly it would only take three weeks to accomplish. However, the federal agencies that fund genome sequencing consider bees to be a low priority, and are putting their funds towards other insects like fruit flies and the malaria mosquito, as well as many more non-insects. Beekeepers might disagree with these choices, and Robinson and his colleagues continue to pursue funding sources, but big-ticket funding for basic honey bee research remains elusive.

Basic research funding for university faculty may be difficult to obtain, but applied funding often is viewed as inferior money, even if grants are substantial. I talked with two leading bee researchers from the United States who both bemoaned the problems facing faculty who want to conduct applied research. Promotion and tenure at our universities are facilitated by receiving at least some funding from agencies such as the National Science Foundation (NSF) and the National Institutes of Health (NIH), both highly competitive organizations with rejection rates hovering around 90%. Large grants for applied research in bee management don't compensate for the lack of a prestigious NSF or NIH grant, and the career of many a young faculty member has foundered on the preference of university administrators for the hard-to-get basic funding.

Another surprise from the Entomological Society of America meetings was the poor attendance by U.S. Department of Agriculture bee scientists. At a meeting where 916 papers and 784 posters about insects were presented, only three USDA bee research scientists gave papers, and one other had a poster. There undoubtedly were many reasons for the USDA's light representation; tight funds, the aftershock from 11 September, turnover in positions, other meetings to attend, etc. Nonetheless, it contributed to the overall lack of energy and enthusiasm I sensed from the bee research community.

I left the ESA meeting concerned about the morale of bee researchers and the apparently declining resources available to our bee research community, but also pondering whether this depressing situation can be improved. The communal good is best served by cooperative and collegial interactions between the researchers who conduct studies and the beekeepers and growers who benefit from bee research. Perhaps a summit meeting between researchers, beekeepers, and growers would be in order, to set national research priorities, establish a more cohesive and coordinated approach to bee research, and develop a strategy to lobby universities, the USDA, and other government agencies for funding.

Prior to summiting, someone needs to put together a comprehensive list of who is doing bee research in the United States, what projects they are working on, the resources and funds available for their work, and the availability of extension capability to transfer important results to the beekeeping community. If my perception of diminished bee research in the United States is correct, we need to determine why, focussing on possible causes such as lower funding, fewer positions, a decreased student population, and/or poor output from researchers for the funding they do receive. We also need to determine the relative significance of federal and state governments and universities in conducting bee research, and work to improve any areas in which performance lags behind industry expectations.

There are a few other tangible steps that might change the current dynamic. For one thing, we need to increase the proportion of research funding that supports students. The best way to overcome lack of depth in our research community is to bring in new blood, and perhaps research grants should increase their focus on training students in addition to the projects themselves.

We also need to provide our students with deeper credentials in both basic and applied research. Faculty succeed or fail on their strength in basic science, whatever the priorities of the beekeeping community may be. The perfect researcher would have a seamless program in which basic and applied work form a continuum rather than a one-or-the-other choice, and those of us training students need to insure their feet are firmly planted in both camps. While our industry may prefer more immediately applicable research, undue focus on applied studies may have contributed to the diminished pool of researchers that faces us today.

A final step would be to increase direct financial support from beekeepers. The lack of substantial national funding from the beekeeping industry for research contributes to difficulties in prying loose government research funding. Canadian beekeepers with their 600,000 colonies have put together a $500,000 national bee research fund, and the much larger American industry should be able to do considerably better. A 25 cent contribution per hive over a four year period would raise close to $3 million, which if used as an endowment could provide $100,000-300,000 annually for beekeeper-directed research, depending on interest rates.

Whatever the long-term remedies may be, I can recommend one short-term balm for the dispirited research community. If you see a bee researcher, give them a big hug. They seem to need it. BC

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Apimondia In Africa

I was surprised at the lack of information on Africanized bees from much of Latin America, with only Venezuela, Uruguay, Brazil and Argentina contributing at the South African Apimondia meeting.

Malcolm T Sanford

The strong Argentinian presence at the South African Apimondia was apparent to even the most casual visitor. The country barely failed to win approval to host the 2005 meeting, but no doubt will be a strong candidate for the 2007 event. There is little doubt that Argentina will continue to be a powerhouse in apiculture for a long time to come in spite of the uncertain economic conditions the country now faces.

No formal agricultural extension service exists in Argentina as does in the United States. In fact, a clear disassociation exists between the formal educational sector (university) and small-scale producers. A recent collaboration, however, between university researchers at La Facultad de Ciencias Veterinarias de la Universidad Nacional del Centro (UNCPBA) and others such as the Facultad de Ciencias Agrarias y Facultad de Ciencias Exactas y Naturales de la Universidad Nacional de Mar del Plata, as well as the ministry of social development has resulted in what is called the Integrated Apicultural Development Project or PROAPI as showcased in South Africa. This is described as an extension network that is particularly necessary at this time, given the fact that small honey producers are considered an important aspect of the development process in Argentina. Paralleling to an extent the Cooperative Extension Service model in the U.S., the network formally recognizes the role of universities and places them in the context of doing research as well as training beekeepers.

Rather like the Master Beekeeper programs in some states, the program has a "train the trainer" approach, where students agree to return to their home base and teach what they've learned. There are two levels. The second one is composed of two years of university education. Much of the program is based on electronic communication via ApiNetLA (formerly APINET) on the World Wide Web <http://www inta.gov ar/apinet/la/index.htm>. I reviewed this site in my *Bee Culture* Digital Age Column in May 2000 <http://bee.airoot.com/beeculture/digital/2000/column21.htm>. Unfortunately, many of the links published in that article have been modified. But the home page still directs the user to applicable sections and is a more robust arrangement of its former self, although still clearly under construction. This is the first integrated knowledge center on apiculture in any Latin American country to my knowledge. Currently it has links to beekeeping in México and the Dominican Republic, as well as Argentina and Perú, in fact metamorphosing into a Latin American apicultural portal. As a consequence, the Web site now refers to itself as ApiNetLA. I reviewed the concept of portals in my Digital Age column March 2000 <http://bee.airoot.com/beeculture/digital/2000/column19.htm>.

Other aspects of the ApiNetLA site include a discussion of Abejas del Tucumán. This name is shown as a registered trademark. According to the site, the honey bees of Tucumán take advantage of exceptional ecological conditions found in Chaqueño park. The beekeepers in this association are also assisted by several governmental agencies to ensure their products adhere to strict quality control standards.

Research is integral to Argentinian beekeeping and was certainly in evidence at the South African Apimondia meeting, and is also implemented on the ApiNetLA Web site. Already described in this series of reports on the South African event is that concerning *Varroa* in Argentina. However, that is just the tip of the iceberg. Papers at the meeting discussed topics in almost all of the standing commissions from content of flavinoids in Argentinian propolis (apitherapy) to mead mak-

The Tentorium Exhibit, from Russia, was the largest at Apimondia.

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ing (Beekeeping Technology and Equipment). The honey bee behavioral research focused on defensive and hygienic behavior. One paper by C. Andere and colleagues contrasted both behaviors in the same population using the standard black ball attractant (defensive behavior) and pin-killed larvae (hygienic behavior). The results showed that both behaviors could be adequately measured in Argentinian populations, but there seemed to be no association between the two. Thus, selecting for one appears to be independent from selecting for the other.

Another paper by C. Andere and colleagues compared both a laboratory and field method for determining defensive behavior. The former used oxygen consumption and the latter a combination of alarm pheromone (isopentyl acetate) and an agitated five centimeter in diameter dark leather ball. Bees from both the Africanized population (Tucuman Province-subtropical) and European population (Tandil Province-temperate) were compared. They differed from each other morphometrically (the standard way to separate ecotypes or races, but not always reliable as noted in part one for the "Capensis:" problem). But the study showed it was not possible to use defensive behavior to distinguish the two types because of extreme variability shown on a daily basis. In general though, subtropical bees were "souped" up (used more oxygen) and faster to sting. The results indicated it was possible to use either field or laboratory methods in breeding programs to select for defensive behavior

A companion paper by M. Palacio and E. Bedascarrasbure discussed a four-year study comparing hygienic behavior, the ability of honey bees to uncap and remove diseased/parasitized larvae. Investigators showed that this could be improved to about 80 percent in stocks from a general background level of about 66 percent using open mating. Thus, instrumental insemination was not important unless a degree of control greater than 80 percent was desired. These traits are the result of recessive genes and thus a degree of inbreeding is needed for greater expression in a bee population. The improvement in the study was considered enough to warrant selection programs using pin-killed brood. The investigation reconfirmed that a general increase in hygienic behavior correlated with a decrease in the incidence of brood diseases.

"Both defensive and hygienic behavior are now considered the two most important traits selected for in a coordinated Argentinean honey bee improvement program, which was reported on at the South African Apimondia."

Both defensive and hygienic behavior are now considered the two most important traits selected for in a coordinated Argentinean honey bee improvement program, which was reported on at the South African Apimondia. This began in 1995 under PROAPI (see discussion above). According to the authors of a paper reporting on this development, among whom is E. Bedascarrasbure, director of PROAPI, and several academics, including Dr. M. Del Hoyo, honey bee projects generally produce genetic information (heritability), developed at universities or specialized laboratories, but usually are not designed to select and distribute stock. The Argentinean stock improvement program (MeGA) attempts to do both. It has several components, including colony evaluation in the field, a program center, which contains the data bases used to make genetic decisions (1135 colonies from eleven regional centers have been evaluated) and even a portable instrumental insemination laboratory that can be taken to the apiary and used on site. The MeGA program is prominently featured on the ApiNetLA Web site described above. In addition, there is a general discussion of selection principles. Included are descriptions of how sex alleles play into honey bee breeding and the basics of instrumental insemination. To my knowledge, this is one of the few integrated breeding programs in modern beekeeping. It might serve as a model for others and certainly deserves further study.

Justin Schmidt discussing swarm traps

Africanized Honey Bees

This author was surprised at the lack of information on Africanized bees from much of Latin America, with only Venezuela, Uruguay, Brazil and Argentina contributing at the South African Apimondia meeting. This is in great contrast to former congresses where often research on this bee was a major topic. Perhaps this means that the situation is indeed now maturing in most of the area invaded by the bees over the last forty years. There was also little contribution from North America, the last frontier of the Africanized honey bee.

The Africanized honey bee problem in the Americas, of course, began in South Africa, when the celebrated geneticist Dr. W Kerr introduced *Apis mellifera scutellata* from that country into Brazil. Four decades later the difficulties and successes of this controversial insect have come home to roost in the world's first-ever Apimondia conference in its homeland. The most complicated situation appears to have developed in Argentina. According to E. Bedascarrasbure and B. Marina, several local ecotypes or races have developed out of a combination of both Africanized and European honey bees. The situation is further complicated by a large introduction of European queens (mostly *Apis mellifera ligustica*) from Buenos Aires province into the northeast and northwest where Africanized honey bees that migrated from Brazil are prevalent. Further study, the authors say, indicates that morphometrically Africanized honey bees are different in much of Argentina than in Brazil. This could explain the fact that many bees in Argentina and Urguay despite increased defensive behavior, are susceptible to *Varroa*,

which does not appear to be the case in Brazil. In spite of problems associated with Africanized honey bees, the authors state that colony honey production is now highest in provinces (Entre Ríos and Tucumán) where the Africanized honey bee predominates. In addition, in studies of sunflower pollination, it has been shown that Africanized honey bees collect more hybrid sunflower pollen than their European cousins.

An update on the Africanized honey bee situation in Venezuela was provided by A. Manrique and G. Piccirillo. This country, perhaps more than any other, was hit hard by these insects. Honey bee colony numbers dropped from 94,000 in 1975 to 25,000 in the year 2000. Honey production declined from 600 metric tons per year to a low of 75 in 1981, and recovering to 480 tons in 1992. Unfortunately, *Varroa* took a further toll on beekeepers at that time, but the industry is again rebounding. From 1996 to 1999 production increased by some 28 percent, topping out at 410 metric tons. Domestic consumption of honey remains low and hobby beekeeping has literally disappeared. There remain many challenges to beekeeping in Venezuela, but as knowledge about the behavior of the bees increases, the authors believe there is an optimistic future in the country for this activity.

A comprehensive review of the impact of the Africanized honey bee in Venezuela was provided by R. Thimann. He compiled a bibliography of published documents from various sources, including newspaper reports and proceedings from meetings and congresses held during the twenty-five year history of the bee's invasion. Unfortunately, the author concludes that there have not been many substantive changes implemented since 1987 when the newspaper *La Nación* published a list of constraints that have kept the Venezuelan Beekeeping Industry from developing to its full potential. These included suggestions made as far back as 1976 such as aggressively training beekeepers in managing the new bee, providing credit when needed, developing projects in actively promoting and selling honey, creating a bee breeding center and mounting a public health program based on averting potential bee attacks.

*"Besides the Africanized honey bee, another exotic insect introduced from South Africa to the Americas is the small hive beetle (*Aethina tumida*)."*

R. Thiman and A. Manrique described observations when comparing queens from Venezuela and Brazil. The latter were instrumentally inseminated and developed from an organized selection program. Brazilian-selected queens produced more honey than did locally selected stock in Venezuela proper. The authors conclude that a breeding program in Venezuela might substantially increase productivity of beekeepers in that country.

As has been a theme over several years, investigators from Brazil continue to state that Africanized honey bees in their country have been a blessing in disguise. This is especially true with reference to their disease resistance. K. Gramacho reported that tolerance to *Varroa* continues in Brazil and no chemical treatments are applied. Nevertheless, disease problems do arise. There appears to be greater incidences of nosema and European foul brood in the country's northeast, presumably due to "inefficient mangement" and/or excessively damp conditions. An outbreak of Chalkbrood has been reported in the south, but has cleared up and may have been caused by susceptible bees. Several viruses have also been detected, including APV (Acute Paralisis Virus), BQCV (Black Queen Cell Virus), FV (Filamentous Virus) and QWV (Cloudy Wing Virus).

The most concerning situation in Brazil is that surrounding American foulbrood, which is reported in nearby Argentina. According to Ms. Gramacho, "Considering the almost generalized distribution of AFB in all the continents, the Brazilian beekeeping and especially, that of Rio Grande do Sul (South of Brazil), enjoys a singular situation due the fact that it is a frontier 'Foulbrood Area' we can say: danger area." To keep this disease at bay Brazilians have relied on both legislative and genetic controls. The former will hopefully keep the disease out of the country altogether. The latter, however, is regarded as an ace in the hole, and given that Africanized bees are more tolerant to almost every beekeeping malady due to hygienic and other behaviors. Brazilian scientists and beekeepers, therefore, are now fully endorsing breeding programs that select for hygienic behavior.

Swarm Traps & Africanized Bees

A major tool in managing Africanized honey bees has been the swarm trap, baited with Nassanov (orientation) pheromone (smells like citrus and geraniums). In the only presentation on these insects from the U.S., Dr. J. Schmidt of the Tucson Bee Research Laboratory presented a historical analysis of the development of the trap. He reported that Steve Thoenes, a beekeeper and bee researcher who helped develop the concept, realized in the 1990s that the time was right to develop a preventive control system. So in 1994 he established BeeMaster, Inc., a company that specialized in deploying perimeter swarm traps around sensitive areas in urban areas of southern Arizona. The company was immediately successful, Dr. Schmidt said, and it deployed thousands of traps around local enterprises, captured several thousand swarms per year, and expanded to include the large metropolitan areas of Phoenix, Las Vegas, and Southern California. The traps were so successful in luring bee swarms to enter traps instead of natural or man made cavities, that BeeMaster, Inc. virtually never had to remove swarms not in a trap from a protected area. Not a single stinging event from a colony not in a trap has occurred in an area protected by swarm traps. One stinging event did occur in California from bees emanating from a trap that, through negligence, had been allowed to remain in place so long that it actually fell to the ground. This failure illustrates how human factors are crucial to any control operation and equipment alone can never be totally successful. Thus, Dr. Schmidt concluded, knowledge from pheromones and its application has benefited beekeep-

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APIMONDIA ... Cont. From Pg. 19

ing, and by extension the general public.

These bee traps are a tried and true example of the research that governmental (ARS) research laboratories can provide to the beekeeping industry. The concept based on this trapping technology has gone on to become a suitable idea for franchising. Dr. Steven Thoenes, owner and founder of BeeMaster, Inc., is now offering qualified investors the unique opportunity to build a successful honey bee protection and removal business of their own. Only a limited number of these agreements are available. They include a training program on bee removal techniques using swarm-trap technology and a guaranteed supply of specialized materials and products. Information is available electronically <http://www.beetraps.com> on the franchising opportunity along with a list of current clients and materials provided.

Small Hive Beetle

Besides the Africanized honey bee, another exotic insect introduced from South Africa to the Americas is the small hive beetle (*Aethina tumida*). Several papers dealt with the biology and control of this pest, some of the first studies to have occurred in South Africa since Dr. Lundie's landmark paper in the 1940s. P. Elzen and colleagues reported that western honey bees (from the state of Florida) were not observed to be as aggressive in attacking small hive beetle adults as were African bees (*Apis mellifera capensis* from Gramstown). Significantly African bees also attacked stationary pins, which were used as controls in the experiment. The authors concluded: "Such comparative lack of aggression of Western honey bees and demonstrated higher aggression of African honey bees may explain the economic status of the small hive beetle in its native and introduced ranges."

According to the authors, beekeepers in the U.S. report that they rarely see managed honey bees aggressively defending the colony against beetle attack, whereas beekeepers in South Africa commonly observe managed Cape honey bees attacking and isolating small hive beetles when they occur in bee colonies. They underscore, however, that the small hive beetle can cause economic damage in South Africa to honey frames removed from colonies and stored for later extraction, particularly if any brood is present in frames. Thus, they conclude that behavior of the adult bees within the hive play a significant role in protecting brood and colony products, which is not the case when frames are removed from the colony and thus without protection.

Besides aggression, another study by J. Ellis and colleagues provided evidence in African bees of other behaviors affecting small hive beetle. They say that African honey bees are unique because they actually construct prisons of wax and propolis (plant resins) in their hives and then kraal (the African term for "corral") the beetles into them. The entrances of these "beetle prisons" are assiduously guarded by worker bees, preventing them from gaining access to the contents of the honey bee nest, which would allow them to reproduce. Despite lack of access to food in the combs, imprisoned beetles may survive for two months or so; but this is not due to stored metabolic reserves because beetles entirely deprived of food die within a week. Thus, the honeybees themselves become suspect of a kind of "beetle husbandry." The authors fed cape honey bees a red dye to see if this was in fact occurring. The dye was found in the beetles, providing good evidence that the beetles were fed during confinement.

A study by J. Ellis and associates compared diets of small hive beetle (SHB). "SHB offspring were found on honey/pollen, pollen, bee brood, fresh kaai apples, rotten kaai apples, and honey alone, but not on wax, or in control treatments (no food at all). The highest reproductive success was found on pollen-fed adults and larvae, suggesting that SHB reproduction in hives of recently absconded colonies might be very successful in nature. The diet of honey bee brood also yielded high reproductive success for SHB." They conclude: "Our data further suggests that SHB are capable of reproducing on fruits alone, indicating 1) that SHB are facultative parasites and 2) that one potential pathway of SHB to the US might have been commercial transport of fruits from southern Africa to ports in the U.S." The fact that some beetle reproduction can take place on fruits alone is surprising and disconcerting and certainly worth more study.

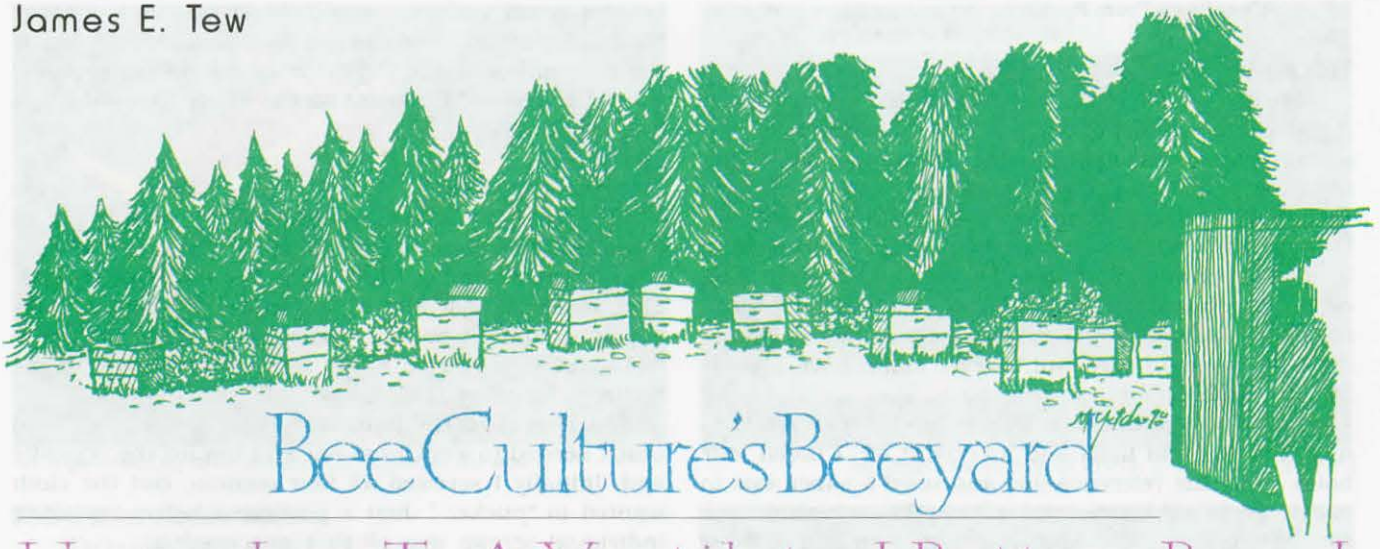
M. Hood provided a comprehensive history of small hive beetle in the United States. It is not known the exact entry point of this insect, but the southeast is a prime candidate. DNA study shows two haplotypes of beetle, one mostly in South Carolina, the other prevalent in Georgia, Florida and North Carolina. Both types were found in the same apiaries in both Florida and Georgia and they appear to be very similar. There are, however, twelve haplotypes in Africa so that further introduction of beetles from Africa can be pinpointed with better accuracy.

The beetle has now spread to many states and is continuing to become a normal part of the U. S. beekeeping scene. Fortunately, according to Dr. Hood, there are controls in place including both Gardstar™ (40 percent permethrin soil treatment) and CheckMite+ (10% coumaphos plastic strip for inside colonies). Other approaches are needed, however, as part of an integrated pest management effort that will serve beekeepers well in the future. This currently involves research in the use of hygienic stock and/or pheromone-baited traps.

So far, the small hive beetle has only been found outside its African homeland in North America. Over time, given the history of other introduced pests on honey bees, this insect will probably show up in other countries in the Americas. Thus, there was extreme interest at the South African Apimondia event surrounding a film that was produced on this insect pest and shown at the event. And considerable controversy was also generated as the production appeared to overemphasize the sensationalistic aspects of the beetle's invasion into North America, in one place characterizing it as the most important world beekeeping pest. BC

Dr. Sanford is former Extension specialist in Apiculture, University of Florida and a regular contributor to these pages. He published the APIS *newsletter: http://apis.ifas.ufl.edu*

James E. Tew



Bee Culture's Beeyard

Upgrading To A Ventilated Bottom Board

It's presently late February. There's snow outside and the temperature is below freezing. No bee work for me today. I have used this excuse with you several times in previous articles. I'm tired of writing it. You're tired of reading it. I want to write about Spring beekeeping – even though I still have several more weeks of Winter with which to deal. Last week I conducted a bee workshop in central Alabama and I actually saw a few dandelions in bloom. Birds were singing and Spring appeared to be just around the corner. A few days ago, I saw a TV spot about a bee swarm hanging from a bicycle in a department store parking lot in Pensacola, Florida. For me, it is still hard Winter, but for many of you, it is already hard Spring and the 2002 bee season is underway.

The Spring transition season is the hardest with which for me to deal in my articles for you. Some of you are already having problems with swarming while others of us (most of us), will not have the same problems for about eight more weeks. With your indulgence, I have decided not to attempt to write a "one-size-fits-all" article in which I discuss the troublesome topic of *Winter swarming*, but rather just go directly to a non-seasonal topic of Bottom Boards – Their Use and Misuse. No matter what season it is, we all need hive bottom boards – don't we?

Ventilated Bottom Boards

Ventilated bottom boards are all the bee rage. They purport to help control *Varroa* and provide for increased ventilation. I don't know. They probably do help. Should you drop everything and go buy the new model bottom boards? Again, I don't know, but I expect not. On this Winter day, I decided to kill two birds with one stone. I would do some maintenance on a couple of old bottom boards and, at the same time, I would upgrade it to the ventilated style (a VBB – ventilated bottom board?).

If you copy mine...

If you copy my ideas, you are on your own. The VBB I developed has not been tested at all. Send me your comments and observations on ventilated bottom boards.

Two needful bottomboards – one even having the back cleat knocked off.

Reference lines ready for hole boring and subsequent cutting.

Continued on Next Page

BEEYARD ... Cont. From Pg. 21

This is what I did....

I took a couple of old, unloved bottom boards – each showing a good deal of dry rot. These boards only have a couple more seasons in their current state so I didn't see that I could go wrong.

Ironically the bottom board having the back cleat knocked off made it easier to measure for the hole and to maneuver my saber saw. I cut off the rotted back edge of the board while I could get to it and I cut out a new back cleat to replace the one that has begun to rot. This bottom board will, forever more, have a short landing board.

I measured a distance far enough from all edges to miss the side rail nails and marked it off. I bored four holes along the reference line and used a saber saw to cut it out. I could have used a SawzAll®, a keyhole saw or a circular saw. Use what you have. I measured three inches from the very back edge (remember the back cleat is temporarily removable). I measured three inches from the outside edge of the rails. The resultant hole was 10½ inches wide x 14 inches deep. I made the cut without incident.

An Unknown

I was concerned that the remaining edges of the cut boards would be floppy in the side rails, but this particular bottom board deck was tongue and grooved. The remaining ends of the cut pieces were remarkably stable. If your bottom board is not made from tongue and groove lumber you may have to add support pieces on the bottom.

The Back Cleat

I used two 1¼ inch galvanized deck screws, inserted from the bottom, to reattach the cleat to the bottom board. I also put a two-inch screw through each end of the rails into the back cleat. I bored pilot holes for everything. It went back together nicely as is shown in the photo.

The Paint

Before installing the 1/8-inch hardware cloth that I bought at a building supply store, I scraped the nasty bottom board as best I could. I put on three coats of Sherwin-Williams Solid Stain *Ranchero Red*, which is the bottom board and top color for my hives in the BC Yard. I was careful to paint all the newly exposed edges inside the hole.

The Hardware Cloth

I cut the 1/8 inch wire cloth to be ¾ inch larger on all sides so the wire measured 12 inches x 15 inches. I considered attaching the hardware cloth with staples. This would be fast and easy, but I didn't see an easy way to scrape the bottom board in the future. I opted to use screws so I could easily remove the screen in the future – for whatever reason.

As I screwed the hardware cloth in place, I found that I needed to work from one end toward the opposite end. Initially I screwed all four corners, but the cloth wanted to "pucker." Just a gentle tug before installing individual screws was all that was needed.

The Second Bottom Board

For the second bottom board, I improvised a simple jig to assist with the layout. Honestly, I'm not doing cabinetwork here. My main effort is to avoid the side rail nails that are in the bottom board floor.

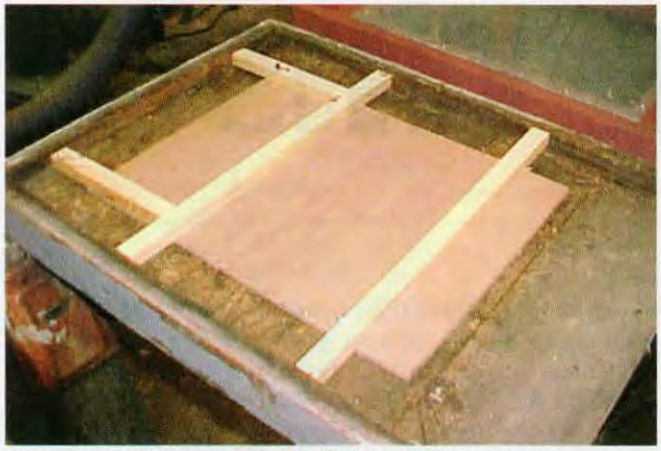
All bottom boards are not standard so I left 1/8 inch of slop on each end of the wooden stops. The jig seemed to position the cutout hole nicely. Otherwise, the second bottom board went the same as the first. I now have two bottom boards finished and figure that I have about 200 yet to go. Maybe I'll do some next winter. No need to rush.

My Tennessee Brother

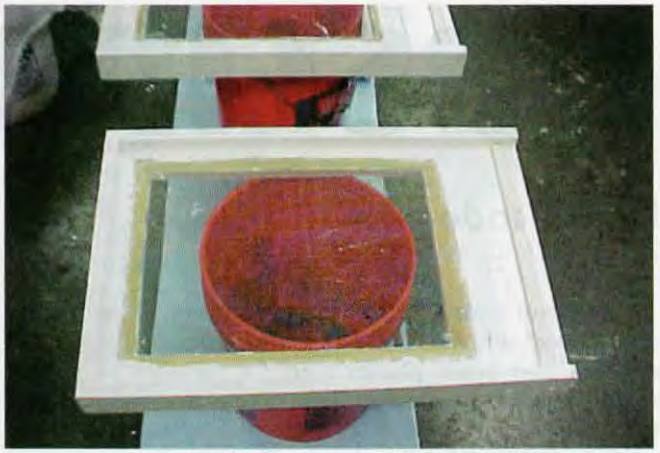
I got the motivation to do a few of these ventilated bottom boards from my beekeeping brother in Tennessee. He bought his ventilated bottom boards and painted them after the screen was installed. He also added carpet strips to the front edge of the bottom boards to help combat his on-going skunk problem. He went with the basic semi-gloss white latex enamel. As is proper, he branded his equipment before painting. I suspect too many of us paint and then brand. The "branding after painting" job is never as neat nor is the brand burned as deeply.

The scraped and painted rejuvenated bottomboard.

The 1/8" hardware cloth screwed in place.



An improvised jig to assist with the layout of the hole.



My brother's version of VBB's. (I think my is better.)

There is no standardization

If you elect to buy new ventilated bottom boards, you should know that the various options vary from one supplier to another. Specifically, the size of the hole varies from one manufacturer to another. Additionally some suppliers put a solid bottom underneath the screen in order for you to install "sticky boards" in order to estimate mite populations. Others have metal sheets or hardboard sheets to slip into the bottom board to cover the hole during Winter months. I'm not sure this is necessary, but it is an interesting option. One model is made from aromatic red cedar, which may – or may not – be helpful. Yet another model is made from expanded polystyrene.

A commercially available ventilated bottomboard.

The Future of these things

I don't know what the future of the ventilated bottom board is. It stands to reason that any *Varroa* mite that drops to the bottom board is going to have a difficult time crawling from the ground back into the hive. Personally, I like the added ventilation. But will this take away the "reversible bottom board feature?" Unless you have wire on both sides, your colony will fill the reversed bottom board hole with dead bees during the Winter months. Will you be able to scrape the ventilated bottom boards efficiently? Try a few. Let me know what the problems and successes are and what models you like best. BC

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OBSERVE THIS!

Melvin Yoder

We read a lot about observation hives, especially in connection with giving talks and demonstrations in schools and other places where a number of people might have an interest in bees. These are usually one- or two-frame portable hives, which is what you need if you're going to take it with you. But have you ever considered building a taller hive permanently in your home or office? Let me tell you about this four-frame hive I bought and remodeled to suit my needs.

This one had a base on which to stand. It could be closed up for moving, so it would actually have to be considered portable, though it would be terribly heavy if it was full of bees and honey.

The first thing I did was take the base off and replace it with a ¾" x 1-1/2" board along the bottom. This was fastened at the back to the upright piece, but at the front it needed to be kept about ¾" below the upright piece to allow space for the bees to enter and exit. An odd-shaped ¾" board attached with plenty of screws on the one side holds it rigid. Also, on the other side the ¼" Plexiglass is screwed directly to the side, top, and bottom pieces. This makes a virtually indestructible hive, at least if you use ¼" Plexiglass on both sides. I only used 1/8" on the other side. It seems to do fine. I put it on with plastic glass clips that came with the original hive. I believe they could be bought at a glass and mirror store, or even in a picture-framing shop or a furniture shop where they make furniture with mirrors. Using the clips on one side makes it easier to install the bees.

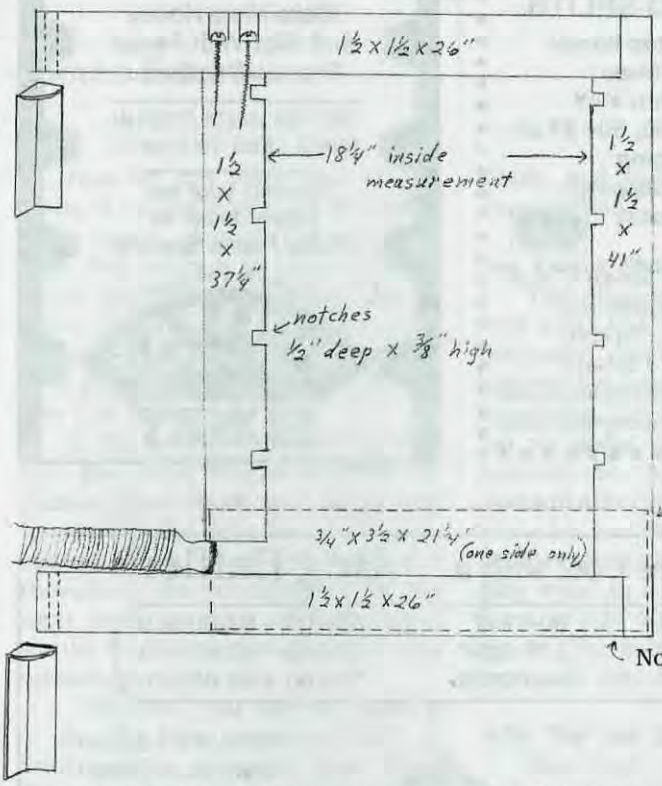
A word of caution: Do NOT yield to the temptation of installing the hive then bringing in a frame or two of bees and sticking them in quickly before too many fly off. Unless you are absolutely the only person who EVER occupies the building where you're installing the hive, you're setting up the perfect opportunity for your office-mates or family to become your closest enemies. Those bees just are not inclined to stay on there while you jerk and push and bang them in there, and get that side glass on. Of course you're not going to jerk and push and bang; you're going to go real easy and steady and they won't even know they got moved. Take my word for it: IT DOES NOT WORK! Maybe after you're done it 50 times outside you'll be ready to do it inside. Don't do it before.

You might want to drill a dozen or so holes through both pieces of Plexiglass before you attach them to the frame, for ventilation. I made mine in the vicinity of the top frame, reasoning that the entrance at the bottom will suffice for an air inlet and all they need is some vent holes at the top. You can either say, like I did, that bees can't get through 3/16" holes and use that size, then have an occasional bee in the room, or you can use 1/8" holes and be safe.

It has been surprising what I've learned from those bees. Perhaps the greatest immediate reward I got from them was one morning after the main honey flow was over but before it was time to start extracting. We noticed that the bees were extra active, going in and out of the hive, even piling up on the outside trying to get in while others were trying to get out. I went inside and watched them in the hive. I quickly noticed that

Hinges:

3-1/2" x 3/8" machine bolts with four washers (two in the middle) and two nuts or a lock nut. The corner blocks can vary in size, but should be made of 3/4" wood and well screwed or nailed.



Material List:
1 2 x 4 x 8' ripped in half lengthwise
1 1 x 4 x 8'
1 pc. Plexiglass ¼ x 26 x 41"
1 pc. Plexiglass 1/8 x 19-3/4 x 37-1/2"
1 fertilizer tube for a grain drill
2 3/8" x 3-1/2" machine bolts
8 3/8" washers
4 3/8" nuts (or 2 lock nuts)
8 glass or mirror clips
about 30 1" screws
about 50 2" screws

Make a 3/16" notch in this 3/4" board for Plexiglass.

Notches: 3/4" x 1-1/2"

there was a lot of dancing going on, as if they were having some big jamboree. I also began to see that most of them were dancing the same direction. "Where could they be going?" I asked myself. Their dance was nearly straight down, but a little to their left. Next, "Where's the sun?" Straight down is directly away from the sun. "What's a little to the left from that direction? My apiary! Are they robbing out a hive out there?" I hurried out and sure enough the very last hive in the row was pushed over with bees tumbling over each other to get some of that prepared food. (I wonder how much different it would look if a grocery store got "pushed over" and people could freely take home whatever food they could carry under their arms.) I got my smoker and veil and saved that hive, thanks to my observation hive. Quite certainly I wouldn't have saved it without that notice.

Besides that I've learned some about food consumption from that hive in the corner of my living room. They had gotten a late start in the Spring and nearly missed the main honey flow, but they did reasonably well from sourwood and clover and whatever else blooms in mid-season. The top frame was virtually full (it's about ¾ capped in these pictures), but then we got a drought and they started eating their Winter stores. It was amazing how quickly they had eaten that all up. I guess it took them about a month. I wondered whether it was even reasonable to try to keep them over Winter in there. But I decided I have only a few thousand bees and a worthless queen to lose by trying it. They appeared healthy as far as I could see. So I fixed a little glass feeding bottle above the entrance tube. I cut a slit in the tube (more about the tube later) and cut the tip off a little balloon. I slipped the factory opening of the balloon over the opening of the bottle and stuck the slit end into the slit of the tube. It seems to work well.

But when Fall came along, or maybe it was when their food supply got dangerously low, they seemed to go into hibernation mode and nearly quit eating. They mostly just sit around like if they were in the old general store passing the hours and enjoying each other's company while the snow flies outside and all we have to do is get rested up before Spring comes around.

Another thing I noticed was that they don't always leave the honey where they put it when they first bring the nectar in. One time when the upper part of the hive was pretty well filled with honey and brood they put nectar into the bottom frame. But later when there was room higher up they moved it up, which tells me that only feeding sugar syrup before we put on the honey supers is no guarantee that they won't still put some of it up there once we do add the supers, especially if we feed more than just what they need at the time.

The entrance tube was actually made as a fertilizer tube for a grain drill. I got it at a farm equipment dealership. They cost around $7.00. The smaller end attaches to the hive and the larger end makes a nice outside entrance. They're very flexible and forgiving, so holes don't have to be very exact. To make the slot for the feeder I just cut off the top of one of the rings.

As you can see, I put mine right in the corner of the house. The board siding helped make this easier, but other kinds of siding could be cut and made to work too, I believe. Some, of course, would be more difficult than others. Once I determined which side of the corner had the studs turned the way I wanted them I pulled off the first board from that side (and put the other, wrong one, back on). With an expansion bit set

OBSERVE THIS ... Cont. From Pg. 25

at two inches and my old hand-powered drill brace I went to work drilling a hole as precisely into the corner as I could. I hit that corner on the inside as perfectly as any high-class bridge engineer could have done, but don't ask me to come and do it for you. The drill bit might not make the necessary curve in your wood like it did in mine.

Though I was able to pull the tube through that 2" hole, I'd aim more at like 2-1/4" if I was doing it again. Two inches was plenty tight. A thin, soft wire can be used to pull the tube through.

I used angle aluminum for the hinges, but if I didn't happen to have that I'd likely use wood. A good straight-grained piece of hardwood such as oak, ash, or hickory a full inch or more thick and an inch and a half wide should hold. Be sure to use washers on the bolts, nuts, and between the pieces of wood to assure it can turn freely. A lock nut or double nuts prevent the nut from working loose. I wouldn't know why the top and bottom piece of the hive couldn't simply be extended enough to become the hinges. Also, even though mine has tapered sides, there seems to be no reason why that would be necessary. BC

A Sunny Disposition

James Fischer

How do you place your hives? Many of us are restricted by limited open space, designated areas on land that belongs to others, access roads, and other non-negotiable issues. Though your choices may be limited, you can still optimize your hive placement by considering factors like the sun.

In the January issue of *Bee Culture*, the article "*Whither Weather*" explained wind roses as a useful tool for finding the direction of the prevailing winds. Once one has given thought to the prevailing winds, the next item for your consideration would be hive orientation to take advantage of the sun.

"Big deal" you may be thinking – "aim the hive entrance South or Southeast* – everyone does that." True, but have you considered the shading of the local terrain, trees, and buildings throughout the year?

The sun can have a significant impact on a beehive. Recall the last time you parked your car in the sun, and found the seats too hot to sit upon. While hives do not have windshields, the ability of the sun to overheat a hive should be clear to anyone who has seen a large number of bees on the outside of the hive in mid-Summer. The sun can have a positive impact in late Winter and early Spring, warming the hive enough to allow the bees to break cluster, and get the queen laying earlier.

An Overview

On the last page of this issue, page 56, is a full-page chart that you can use to track the apparent motion of the sun in the sky throughout the year. This article will explain how to use the chart to position your hives, taking advantage of the local terrain, or at least minimizing the impact of any negative aspects of your apiary site. You can use the chart to evaluate at what times of day and at what times of year your hives will be in sun or shade, and find positions that meet your needs.

Sun Versus Shade

The choice of "shade" versus "full sun" has been the subject of extensive discussion among beekeepers for longer than I have been breathing, let alone keeping bees. I'm not going to take sides. I'll just provide the tools and techniques that will allow you to provide for your hives as you wish. In general, the warmer your climate, the more you may want to consider placing your hives to take advantage of afternoon shade. The cooler your climate, the more you may favor "full sun"

Why The Sun Is Higher In Summer

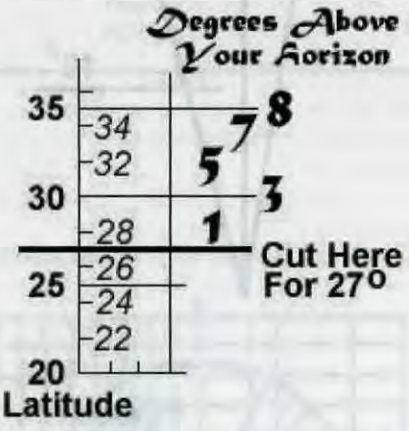
The chart shows a higher and wider sun path during Summer months. For those of you who have forgotten your science classes, I should explain. The further away you are from the equator, the lower the sun will appear above the horizon. The Earth's axis is tilted at an angle of about 23 degrees. As the Earth orbits the Sun, the North Pole alternates between pointing "away from" or "towards" the Sun. When the pole closest to you points towards the sun, you have Summer. When it points away, you have Winter. This why in Winter, the sun appears to be lower in the sky than in Summer.

Changes In Latitudes, Changes In Attitudes

To start, you need to know the latitude of your apiary. Latitude is simply how far you are away from the equator, expressed in degrees. The equator is at 0°, and the poles are at 90° Any decent map should list latitude along its edges. A round number within one degree is close enough for your purposes.

If you keep bees closer to the equator than 20 degrees, or further from the equator than 55 degrees, the chart provided will not be accurate. You can make an accurate chart for your location at a website provided by U. Oregon. http://solardat.uoregon.edu/SunChartProgram.html (Instructions specific to beekeepers who are South of the equator are given in the box at the end of this article.)

Make a photocopy or remove the page with the chart, and find your latitude along the left edge of the chart. Each line that crosses the chart represents 5 degrees, and each tic mark represents an even-numbered 2 degree interval. For example, lets assume that you are 27 degrees away from the equator (near Jupiter Inlet in Florida). As shown in the figure below, find 27 degrees along the left edge, and cut off the bottom of the chart along that line. Label the vertical scale of the chart, starting with zero at the bottom, and counting up by 2 degree increments for each tick line and line that crosses the chart. These labels you are making will indicate the angle above your horizon.



Adjusting For Your Declination

The chart shows "True South" at the center. This is not the magnetic south shown by a compass. The difference is the magnetic declination for your area, which is listed on hiking maps. Find the symbol on a map of your area like the one shown below. If no maps are handy,

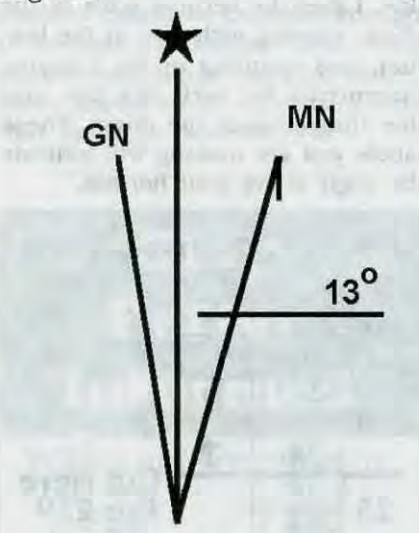
Continued on Next Page

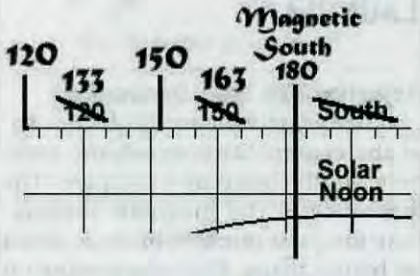
SUNNY ... Cont. From Page 27

there is a worldwide declination chart at http://www.thecompassstore.com/decvar.html

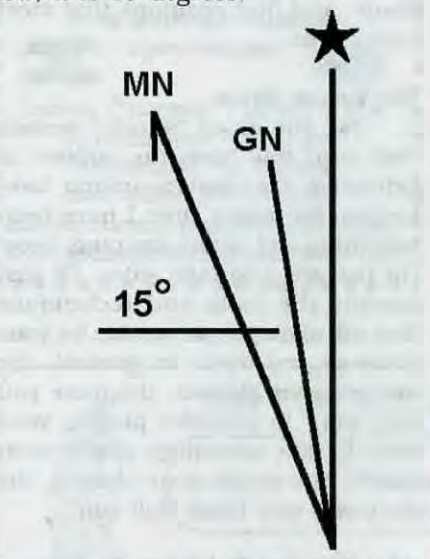
The first example shown below is typical for locations west of the US Great Lakes in the 48 states of the USA.

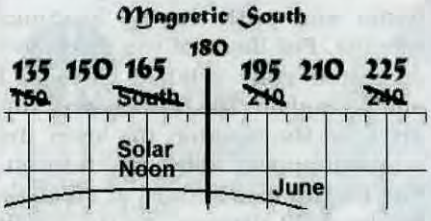
You are interested in the difference between the "MN" (magnetic north) and the "★" ("True North", represented by the North Star), which in the example below is 13 degrees. Since the star on the map's diagram is to the left of the magnetic north line, you would mark magnetic south 13 degrees to the left of the center line on the chart. You would also add 13 degrees to each label for the vertical lines, or better still, mark the map to match the numbers on your compass. (Note that your actual declination will likely not be 13 degrees. Use the number you find on your map.) Each tic mark along the top of the chart represents 5 degrees, and each line that crosses the chart represents 15 degrees.





If you are East of the U.S. Great Lakes, your map will show the "★" to the right of the "MN", like the example below. In this case, you would mark magnetic south to the right of the center line of the chart, and subtract whatever number of degrees indicated on the map's declination diagram. In the example below, it is 15 degrees.





Once you have adjusted the chart for your local declination, you can then photocopy your modified chart onto clear overhead gels. All copy shops have overhead gels. The cost is about the same as a paper photocopy. The idea is that you can face South, hold the chart in front of your eyes, and use a compass to sight the location of objects that block the sun.

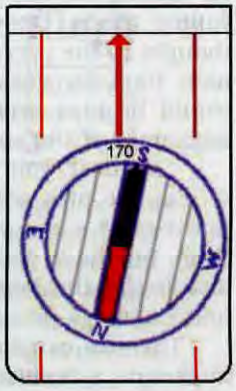
Since 90 degrees is East, and 270 degrees is West, the chart should be held as a cylinder, with your nose at the center. The elliptical lines on the chart then match the sun's path as it moves across the sky during each month of the year.

Lost Horizons

If you are surrounded by hills, trees, or other objects that block your view of the horizon, do not make the mistake of thinking that the horizon is where the sky appears to start. Hold the chart before you and estimate where the horizon would be if you were on perfectly flat land, which should be at eye level in the distance. If your apiary is on a hillside and you have a panoramic view of a valley below, the horizon will be below you, so adjust accordingly.

North By Northwest

If you are unfamiliar with using a compass, simply turn the compass in your hand until the pointer (often red) points at the zero degree mark (or points to "N"). While keeping the needled pointed at "N" rotate the plastic base until the sighting arrow on the base points at the object of interest. When the arrow points at the object, and the compass needle points at "N", you can then read the number on the compass ring to find the sighting to the object. In the example below, the compass is pointing at an object at 170 degrees. If this explanation is confusing, find a Boy Scout or Army Veteran to show you.



Mapping The Terrain

You can use your compass to find the position and width of terrain objects in terms of degrees on the compass. If you wish, you can draw the objects on your chart with a felt-tip marker or crayon, but many people can see at glance if they have a "problem" or not, and move about the apiary site, looking at options from the hive's point of view.

You can also estimate how high above the horizon each feature is. This is easier than it sounds. You do not need a surveyor's transit. If you point straight up, that is 90 degrees above the horizon. Halfway down to the horizon from straight up is 45 degrees. Half again is 22.5 degrees. The horizon is 0 degrees. You get the idea.

Month Of Year

Each curve on the chart shows the Sun's path on the 21st of the indicated months. The sun's height above the horizon changes at a fairly constant rate, so if there is a specific date of interest, you can guesstimate it as a line between any two of the lines shown.

Hour Of Day

The lines labeled with negative numbers on the left side of the chart and with positive numbers on the right side of the chart are hours before and after "Solar Noon" which is when the sun reaches its highest point in the sky. You can estimate at what time of day that the hive will be shaded, and when the hive will be in full sun. (The hour lines shown are less accurate as one gets further away than 40 degrees from the equator.)

Terrain Objects

While buildings, hills, and coniferous trees will block the sun year-round, deciduous trees will only block the sun in the Summer, not in the Winter or Spring. Those who favor shaded hives will want to exploit the deciduous trees to maximum advantage.

Optimizing Hive Positions

If you don't like a position, you can move around, holding up the chart from time to time to find a better place for a hive or group of hives. In the diagram shown below, a single tree is shown, and has been scribbled onto the chart in the correct position. Depending upon how close the tree is to you, a move to the right of only a few feet r enough to get it "out of the

Morning Sun

There is at least one general consensus among beekeepers on "sun versus shade". Bees tend to start foraging earlier if the hive entrance is exposed to the early morning sun. The apparent location of the sunrise moves Northeastward in Spring, and moves towards Southeast in Fall. Give careful attention to the eastern side of any prospective hive location.

Early Spring Sun

Early Spring is when you want the queen to start laying. The sun is fairly low in the sky during that time, so you may find buildings and trees that will shade their hives, and reduce the sun's ability to help warm the hive for brood-rearing benefits.

Moving Hives

If you find that you wish to move existing hives, you face the problem of bees returning from foraging trips to the old hive location. The best approach would be moving the hive less than 5 feet at a time over a period of a few weeks. Hives should only be moved when temperatures are high enough that there is no chance of the bees being clustered. A common suggestion is to move hives only at night, but one can more easily make these short moves during the day. BC

Most of James Fischer's hives are near 37°26'03"N, 79°35'30"W.

For readers south of the Equator

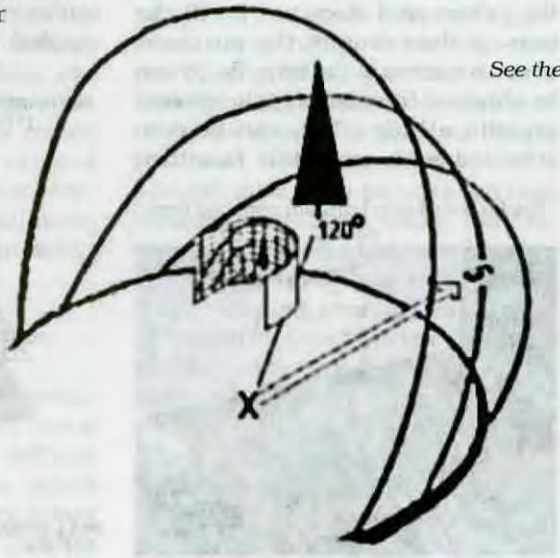
Since you are south of the Equator, replace all references to "South" in this article with "North"

The sun still rises in the east no matter where you are, so you don't need to change references to East and West.

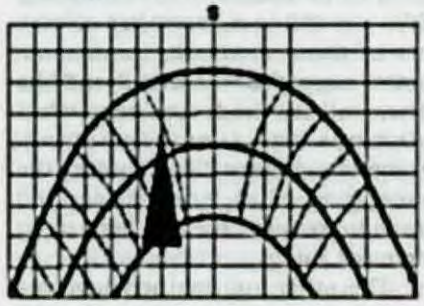
When adjusting for declination, you will also need to reverse "left" with "right", add when the article says "subtract", and subtract when it says "add"

Readers south of the equator will also need to re-label the compass headings at the top of the chart, changing "South" to "North", and changing the numeric compass headings for every 30-degree interval across the top of the chart. You also need to swap all the month labels on the chart, except the "Mar/Sep" label as follows:

Label	Swap With
Dec	June
Jan/Nov	May/Jul
Feb/Oct	Apr/Aug



See the full page chart on Page 56



Try A TENNESSEE TRAP

Easy To Make, Simple To Use

J.P Parkman*
J.A. Skinner
M.D Studer

Monitoring and detection of pest infestations is an important component of any integrated pest management program, including one to reduce *Varroa* mite damage to honey bee colonies. Because the *Varroa* mite occurs throughout the Americas, responsible beekeepers need to know if their bees are infested and, if so, to what extent. Preventative treatments of legal *Varroa* miticides are used by most beekeepers because prevention insures that losses are kept to a minimum. Treatments may not be needed, however, if *Varroa* isn't present or if mite populations are low. With this article we hope to provide a simple and inexpensive way to monitor and detect this pest in honey bee colonies. This tool will also allow you to decide if and when you need to treat. In turn, reducing, or perhaps eliminating *Varroa* treatments will save you money and should decrease potential chemical contamination of hive products.

Sampling Methods for *Varroa*

A few methods have been devised to determine the abundance of *Varroa* within a honey bee colony. Two of these methods, the inspection of capped drone brood and the ether roll method, are somewhat laborious and time consuming. Drone brood inspection requires the uncapping of at least 25 capped drone brood per hive and inspecting them for mites.

The ether roll method involves the collection of approximately 300 bees from a hive into a jar, spraying them with two squirts of ether starting fluid, sealing, shaking and rolling the jar for about 30 seconds, and then counting the mites on the side of the jar which have fallen off the bees. A recent modification of this method uses powdered sugar, rather than starting fluid, to dislodge mites from bees (Macedo & Ellis 2000) without harming the bees. Fakhimzadeh (2001), however, found that a small percentage of bees (approximately 5%) can be killed by sugar dusting for mites.

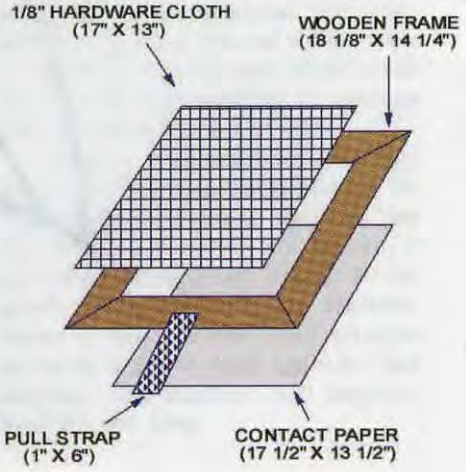
A third method which is more user-friendly involves placing sticky board traps onto hive bottom boards. Before using the sticky board technique, the bottom board should be cleared of propolis and burr comb. A sheet of sticky material, set in a frame, is placed within the hive on the bottom board. Mites drop from above onto the sticky material where they are trapped and counted later by the beekeeper. Although this method is less time consuming than the others and does not harm the bees, it does require the purchase or construction of the trap. Traps can be obtained from bee supply vendors or, with a little effort, can be constructed with materials found at most hardware stores.

Sticky board trap partially removed from colony.

Components and Construction of the Tennessee Sticky Board Trap

The sticky board traps we use are made of just a few simple materials: wooden "doorstop" molding (1 3/8″ wide by 3/8″ thick) comprises the frame, 1/8″- hardware cloth lays across the top of the frame and prevents bees from getting trapped, and contact shelf paper (transparent is best) provides the sticky surface. Doorstop molding is used because it has smooth, beveled edges allowing for easy insertion and removal of the trap on the bottom board through the hive entrance (see photo below left). One-eighth inch hardware cloth is used because it is large enough to allow mites to fall through, yet small enough to prevent bees from getting stuck on the contact paper.

Dimensions for trap components are given in the diagram below. Frames are constructed so that the beveled edges of the molding face outward. Frame sides are first stapled at the corners on the flat



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side. Hardware cloth is next attached to the beveled side of the frame using 3/8" staples. A pull strap, made of durable material such as canvas strapping or plastic (lawn chair) webbing, is attached to one end of the frame to aid in removing the trap from the hive. It is best to cut the entire roll of contact paper (while it is still on the roll) to the desired length (17 ½ inches), then cut widths as needed from the roll.

Construction costs are very economical. Components needed to complete one trap were purchased in Knoxville (east Tennessee) for $2.20. By contrast, the commercially available sticky boards cost $2.50 each and can be used only once. Our board is reusable indefinitely with only the sticky contact paper needing replacement which costs about $0.20 per board.

Uses of the Trap

Sticky board traps can be used alone or with Apistan® strips to rapidly estimate *Varroa* abundance. When placing the trap under the colony, place two Apistan® strips within the brood cluster. After 24 hours remove the trap and the strips. If mites are numerous in the colony and they are not resistant to Apistan®, many should be collected on the trap. Mites can be collected without Apistan® by relying on the natural fall of mites from the colony. Fewer mites will be collected; therefore, the trap may need to remain beneath the colony for three or four days. If left for too long, debris from the colony may build up on the trap and obscure some of the trapped mites, making counting difficult.

The amount and location of debris collected on the trap may be used as an estimator of colony size by indicating the width of the cluster. In addition, collection of colony debris, such as dead bees or dead brood removed during "housekeeping", for example chalkbrood mummies, can provide important information about colony health.

Relating Trap Catch to *Varroa* Population Size

Varroa mites spend approximately 80% of their lives in brood cells. For this reason, it is difficult to relate mite drop count to actual number of mites in the entire honey bee colony. The percentage of mites within a honey bee colony which are on adult bees at any one time can vary with colony conditions such as number of brood cells and the worker:drone brood ratio. Local climate, of course, also affects mite population dynamics. Ellis and Baxendale (1994) found only 10% of mites were on adult bees in colonies sampled in July and August in Nebraska. Delaplane and Hood (1997), working in the piedmont of Georgia and South Carolina, reported that 38% of mites within test colonies sampled in August were on adult bees.

By sampling entire honey bee colonies, researchers have been able to correlate the number of mites sampled to the total number of mites in a colony. Liebig and his colleagues (1984) reported that one mite collected from a natural drop in 24 hours equates to 120 mites in the colony. Delaplane and Hood (1997) found that the number of mites collected during natural drop in a 18-hour period represented from 0.6 9.7% of the total number of mites in the bee colony. Mussen (1994) suggested that the total number of *Varroa* mites in a colony can be estimated by multiplying the number of mites found in a 300-bee ether roll by 500.

Dewey Caron and students at the University of Delaware used mite drop sticky board collections during Apistan® treatment to estimate total mite population size. They determined that daily natural mite fall represented an average of 18 - 19% (range of 9 - 24%) of daily acaricide-induced mite fall (http://ag.udel.edu/departments/ento/staff/dmcaron/Apiology/mitesurvey.htm). From this research they found that the natural mite drop of at least three consecutive days should be used to obtain the most accurate estimate of a natural mite drop-per-day average (Granger and Caron 1998). Our research results also indicate that this average should be based on the mite drop collected over at least three consecutive days. Such mite drop-per-day averages are used to express what are known as action, economic or treatment thresholds.

Using *Varroa* Collections as a Treatment Decision Tool

The treatment threshold is the *Varroa* population level at which some control action should be taken. Treatment thresholds often vary due to differences in factors such as mite population dynamics and the local climate of the research location. Eric Mussen of the University of California recommended an August acaricide treatment if 1 2 mites are found in a 150-300-bee ether roll or if 20 200 mites are found in a 24-hour, acaricide-assisted sticky board collection (Mussen 1994). Caron (2000) determined September treatment thresholds for the mid-Atlantic region of 43 and 60 mites per day in 1998 and 1999, respectively (based on a total-mite population threshold of 3000 mites). Working in Washington State, Strange and Sheppard (2001) developed thresholds of 3 and 24 mites (April) and 14 and 46 mites (August) for ether roll and 48-hour sticky board counts, respectively. Ingemar Fries recommends that Swedish beekeepers treat as soon as possible once 10 - 20 mites are collected from natural drop on sticky boards in June; and to treat immediately if greater than 20 mites are found (personal communication).

Working in the southeastern USA piedmont, Keith Delaplane and Mike Hood conducted detailed field studies to more precisely define treatment thresholds for their region. First-year honey bee colonies containing approximately 25,000 bees and 7000 sealed brood cells were studied. They found August treatments necessary if a 300-bee ether roll yielded 15 mites or if 117 mites were collected overnight from natural mite fall on sticky boards (Delaplane and Hood 1997). For overwintered, mature colonies, they determined a late-season treatment threshold for colonies containing 24,808 - 33,699 bees and 3172 4261 mites to be 15 - 38 for an ether roll and 59 - 187 for an overnight collection of natural mite fall on sticky boards (Delaplane and Hood 1999).

To evaluate *Varroa* control tactics we have sampled mite populations during several seasons using our sticky board traps and have obtained data for natural and acaracide-induced mite drop. Our natural mite drop-per-day averages (based on 3 to 9 days of consecutive mite counts) and their relationships to total mite populations, based on

Continued on Page 33

Why Should I Monitor for *Varroa* Mites & What Is The Best Way To Do It?

Nancy Ostiguy, Maryann Frazier, Diana Sammataro

When *Varroa* first arrived in the U.S., we responded by inserting Apistan® strips (fluvalinate) into our colonies in the hope that we would wipe out the mites that were killing our bees. It has been over a decade since we began using fluvalinate and *Varroa* has become resistant to it. It is even beginning to show resistance to Check Mite+® (coumaphos). We now acknowledge that we will not be able to wipe out *Varroa*. This is not to say that we should stop trying to limit the harm that *Varroa* can cause; we need to control *Varroa*. What we need to do is change tactics. Dewey Caron, Mike Hood, Mark Winston, Nick Calderone and many others have been telling us for several years that we need to employ Integrated Pest Management (IPM) strategies to control *Varroa* populations and to monitor *Varroa* levels to determine if and when treatments are necessary.

Varroa monitoring is done to reduce the risk of resistance development, to save money and to prevent your colonies from dying when mite levels are excessive. You are monitoring to see if the mite level exceeds the *economic threshold* – when the colony damage (reduced hive productivity, etc.) by mites exceeds the amount of money it will cost to reduce the number of mites. If a miticide is applied when mite levels are below the economic threshold, money has been wasted by using an unneeded miticide and there is an increased risk of mites developing resistance. If the mite population has risen to a level that the colony will die regardless of your actions, you will not only lose your colony, but you have wasted money on the miticide.

Effective management of *Varroa* requires a sampling method. While we don't need to know the absolute number of mites in a colony, we do need to know that our sampling method does not over- or underestimate the number of mites in the colony and that it reflects the true number of mites in a colony. Then, if the number of mites counted exceeds the economic threshold value, we can trust the information and proceed accordingly by treating (or not treating) our colonies. Additionally, an ideal sampling method would not kill bees. We evaluated several methods to determine if they could reliably predict the number of mites in a colony. The methods evaluated were ether and powdered sugar roll and natural mite drop using sticky boards.

It is a bad news/good news story about ether and powdered sugar rolls. The bad news is that ether and powdered sugar rolls do not accurately predict the total number of mites in the colony and are unpredictable as to whether they under or overestimate the true number of mites in a colony. Sometimes you get an overestimate of the number of mites; your sample will have a large number of mites, but the actual number of mites in the colony does not warrant treatment. Other times your sample will be an underestimate of true mite numbers; your sample will have few mites, but the colony needs to be treated because there are so many mites that the colony will die without treatment. Additional bad news is that if you take two samples of bees from the same colony and do an ether roll with one sample and a powdered sugar roll with the other, you do not get the same answer. A powdered sugar roll typically will give you a larger estimate of how many mites are on the bees. It seems that powdered sugar knocks more mites off the bees. The good news is powdered sugar rolls don't kill bees and you get a better estimate of the number of mites on your sample of bees than with an ether roll, even if you don't know if the number of mites in the sample is under- or overestimating the mites in the colony.

Using a natural mite drop sticky board is also a bad and good news story, but it is mostly good news and the story is much less confusing than the ether and powdered sugar roll story. Natural mite drop sticky boards provide a good estimate of the total number of mites in a colony. It doesn't matter if you have a colony with large or small number of mites; the estimate from the sticky board is accurate. That's the good news. The primary problem with this sampling method is that it can be time consuming, especially the first time you use a board, because the bottom board needs to be cleaned of debris and propolis. A second problem is the small size of *Varroa*, which makes them hard to see, especially if they are covered with debris or other mites. Fortunately, it is necessary only to count mites on the sticky board until you exceed the economic threshold value. If you reach this number, you can stop counting and decide on what you wish to do to reduce the number of mites in your colonies. [Researchers using sticky boards are not so lucky; we need to count all the mites on the board.]

Mite thresholds have not been determined for all parts of the country, but they are very unlikely to ever exceed 200 mites on a sticky board. Even better, with the PSU/IPM *Varroa* Board developed at Penn State (available through Great Lakes IPM), you need to count only 1/3 of the mites that fall on the sticky board – 70 mites (if the economic threshold used is 210 mites). Sticky boards, after the initial time investment cleaning the bottom board, can be an easy and effective way to monitor *Varroa*. Recent research b Delaplane and Hood indicates that in the southeast U.S. a count of 20-63 mites on the PSU board is the threshold. In the mid-Atlantic states caron indicates a count of 27-34 is the threshold number.

Even though the sticky board is a good sampling method, we would like for beekeepers to have a choice. We were unable with the ether and powdered sugar roll methods to produce reliable estimates of mite levels, but we think it may be possible to do this for the powdered sugar roll. We will continue to work on this. In the meantime, the sticky boards are a good alternative sampling method for determining if mite levels in your colonies have exceeded the economic threshold. BC

TN TRAP ... Cont. From Pg. 31

acaricide (Apistan® and CheckMite+®)-induced drop (Caron 2000), varied by year and season. Natural drop occurring in 24 hours in small to medium-sized colonies (7000 - 26,000 bees per colony) represented from 0.9 to 2.1% of the total mite population: 0.9% (March 1999), 1.0% (August 1998), 1.4% (May 1998), 1.6% (February 2000), 1.9% (September 1999), 2.0% (October 1999), 2.0% (September 1997) and 2.1% (September 2000). There was no significant association between number of bees and the natural drop/total mite population ratio. It is not surprising that this ratio was generally greater for late summer/fall because there is less brood then and more mites are on adult bees.

Using our August 1998 data (Skinner et al. 2001), which can be compared with Delaplane and Hood (1999), and a simplified extrapolation of their estimated thresholds, reveals a total mite population threshold of approximately 2560 mites. This is based on an average colony size of approximately 21,000 bees (= 11.5 medium frames of bees). Using this total mite threshold and the natural mite drop/total mite population ratio for August 1998 (1%), we estimate that a late-season treatment threshold, for a medium-sized colony in east Tennessee, is reached when approximately 26 mites are collected on a sticky board during 24 hours of natural drop.

This estimate, and those of Delaplane and Hood (1997 1999), pertain to sampling using sticky boards with a collection surface area of 175 square inches (K. S. Delaplane, personal communication). The collection area of our home-made board design presented here is similar, approximately 177 square inches. The surface area of a commercially-available insert may be different. The collection area of the sticky board trap you are using must be taken into account when attempting to determine whether or not to treat. These decisions would be easier to make if researchers would provide the size of the collection area when reporting on results of sticky board trap catches. Then a more reliable consensus on *Varroa* sampling and thresholds could be established.

Debris pattern on trap indicating approximate size of colony cluster.

Advantages and Disadvantages of Using a Sticky Board Trap

Development of *Varroa* mite population estimators and action thresholds must take into account honey bee colony status and mite population dynamics. They must also be developed for different climatic regions. Clearly, though, a beekeeper can stay on top of his or her mite situation by monitoring. A homemade sticky board offers an inexpensive way to accomplish this goal and is simpler to use and more reliable than other methods. Fries et al. (1991) and Delaplane and Hood (1997) found sampling natural mite drop with a sticky board to be more accurate than other methods used in their respective studies. We explain this observation by noting that a sticky board samples the entire colony, whereas ether rolls and capped brood examinations sample only a small portion of the colony.

One drawback to using sticky boards is that two trips to the apiary are required to obtain a mite drop count. In this respect, the ether roll and brood inspection methods may be more desirable because they give more immediate results. However, they require opening the hive and, in cooler weather, disrupting the cluster. And, of course, brood inspections can not be made during broodless periods.

Varroa monitoring with sticky boards requires more time; therefore, it may be best for those with fewer time constraints such as hobbyist beekeepers. But it can be done with minimum disturbance of the bees and at any time of the year, regardless of the presence or absence of brood. And it has the additional benefit of potentially reducing the amount of pesticides placed in your honey bee colonies. We thank the University of Tennessee Institute of Agriculture and the Tennessee Beekeepers Association for providing support for this project. BC

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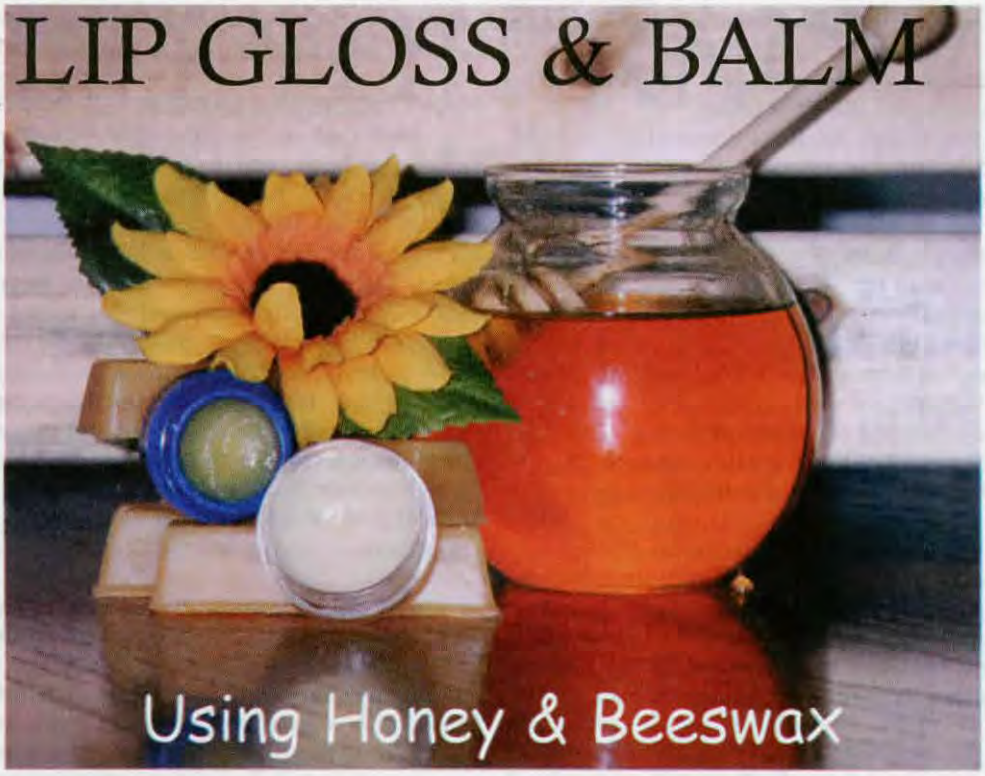
LIP GLOSS & BALM

Christina Spence



Recipes Included:

- Honey 'n' Almond Lip Gloss
Nourishing Honey Lip Balm

If you have read each article in this series thus far, you'll have learned how to make honey-based moisturizers and soap. These additional products can be very profitable to beekeepers, since more and more consumers are looking for natural toiletries. Now, we're turning our attention to another very popular item that will be a beneficial addition to your inventory – honey lip glosses and balms.

Even large commercial manufacturers know that using honey is a smart addition to any beauty product. But beekeepers are far more aware that honey has beneficial properties. Honey is a natural humectant, meaning that it both attracts and retains moisture. This makes it a perfect ingredient to use in a wide array of beauty products. Honey and beeswax naturally help to soothe chapped and irritated lips. And, since honey is also an anti-irritant, it is suitable for even the most sensitive skin. Best of all, it's a safe and organic product, and that is very appealing to consumers.

This time around we're focusing on creating honey lip products. The first, a lip-gloss, is a silky honey and vitamin E creation that makes lips shine while providing natural moisture. Women and young girls in particular will love this type of product. The second, a lip balm, is both thicker and richer, and uses more beeswax as a base. Unlike a lip-gloss, it doesn't provide a lot of shine for the lips, but is meant to help soften even the most dried and chapped lips. This product is appropriate for any consumer, male or female.

Honey and beeswax are essential in each of these recipes. The beeswax helps to 'set up' the product, by solidifying it. In the lip-gloss, you use less beeswax and more oil, to create a shinier product. The balm has more beeswax and less oil, which will make for a thicker, denser product. The honey in all of these recipes helps to moisturize and soothe lips, and lends the products a delicate honey scent that is very appealing to customers of all ages.

Making these products is very simple once you have the basic recipes and ingredients at your disposal. A double boiler used on top of the stove is all you really need to make a lipgloss or balm – you can even use a microwave oven! Vitamin E capsules are also used in both recipes. Vitamin E is a natural preservative which will help these products last indefinitely.

Honey 'n' Almond Lip Gloss

Makes 2 pots of lip gloss

Ingredients:

2 tsp. grated beeswax
7 tsp. sweet almond oil
1 tsp. honey
1 Vitamin E capsule (oil filled gelatin capsules – pierce capsule with a pin and squeeze out the Vitamin E oil)

Melt the oil and beeswax together in a small pan over low heat until the beeswax is melted. Remove from heat and add honey and whisk well. Add the almond extract and Vitamin E oil. Mix once more and pour immediately into containers, as the gloss will begin to harden quickly.

** **Alternative method** **

I successfully used the microwave to create this gloss. In a small microwave-safe container, combine the beeswax and oil. At medium heat, melt the wax and oil together for about one minute, stirring after thirty seconds. When ready, the mixture will be com-

Continued on Next Page

GLOSS & BALM ... Cont. From Pg. 35

pletely clear, and all bits of wax will be melted. You may need an additional 30-45 seconds.

Complete the recipe as in the stovetop method, above. I found using the microwave easier and less messy than making it on the stove.

Nourishing Honey Lip Balm

Makes 1 pot or tube of lip balm
Ingredients Needed:
2 Teaspoons Olive Oil
1 ½ teaspoons grated beeswax
1/2 Teaspoon Honey
3-4 drops Honey flavored oil (optional)
1 Vitamin E Capsule (oil-filled gelatin capsule; pierce with a pin and squeeze out the contents)

Directions:
Melt the oil, honey and wax over low heat in a double boiler. Remove from heat and add the flavoring and contents of the Vitamin E capsule. Stir to blend and then pour into containers immediately, as the balm will start to harden as soon as it begins to cool.

INGREDIENTS

You'll be able to supply the honey and beeswax needed in these recipes, but what about the other ingredients? Olive oil is found at any supermarket. The sweet almond oil, used in the gloss recipe, usually will need to be special ordered. Sweet almond oil is a luxurious nut oil used to make all kinds of toiletries. Vitamin E capsules are available at most pharmacies. Be sure to purchase the oil-filled gelatin capsules, and not the pill variety.

1. Majestic Mountain Sage – One of the best online suppliers of all products needed to create homemade beauty products. Flavorings, sweet almond oil, soapmaking supplies, and much more can be found here. Visit at http://www.thesage.com. The prices are very low, and you can buy in very small quantities, which is perfect when you're just getting started out.

CONTAINERS AND LABELS

Now that you've gone to the trouble of making lipgloss and balm, you'll want the right containers to store them in. You'll probably also need professional looking labels for the new products.

Creating labels with a home computer is relatively easy. Visit your local office supply store for specialized software that creates beautiful labels using your PC and printer. These programs usually cost around $20-$30 or less. Or, contact local printers to help make a label that is just right for your business.

The choice of containers for these products is a miniature jar or tin, a twistable lip balm tube, or a lip gloss container with sponge-tip applicator. These, and other types of containers, can be found at the following suppliers:

1. http://www.CoolCosmeticPackaging.com – Just as its name suggests, this website is filled with a helpful online catalog of all sorts of different cosmetic packaging options. You'll find a very nice clear tube for lipgloss with a sponge applicator. There are literally hundreds of containers to choose from here.
2. Sweet Cakes – http://www.sweetcakes.com – This company has a terrific line of lip gloss/balm pots that are both cute and colorful. They also carry a wide variety of ingredients needed to make your own toiletries. Also a nice selection of twist-up lip balm tubes.
3. Majestic Mountain Sage – http://www.thesage.com – Listed above as a great source of ingredients, this company also has a wide assortment of containers.

An especially popular item with girls and women, lip glosses and balms can become another very effective way to make additional profits with honey and beeswax. While simple to make, they are equally simple to sell – and will result in plenty of new sales. BC

?DO YOU KNOW?

Honey

Clarence Collison
Mississippi State University

Honeys are classified by the principal sources from which the bees gathered the nectar. Although bees may work only one plant source at a time, the chances are that there is nectar from several plant types in most honeys. Ordinarily, honey is identified by one or more prominent floral sources. There are over 300 different types of honey produced in the U.S. and they differ in color and flavor, depending on the predominant floral source. Recently I had the opportunity to judge the state entries for the 2002 4-H Bee Essay Contest sponsored by the American Beekeeping Federation. The topic this year was "A Tasting Tour of U.S. Honey Varieties."

How familiar are you with the different types of honeys produced in the U.S.? Take a few minutes and answer the following questions on this important topic.

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

1. ____ Honey and honeydew are identical in chemical composition.
2. ____ Heather honey is a unique honey type produced in the northwestern U.S.
3. ____ The honey property known as thixotropy is due to the presence of a mineral found only in honeys exhibiting this property, i.e. heather and manuka honeys.
4. ____ Honeys produced from the same plant source are generally darker in color when produced during a fast and heavy honey flow than when they result from a slower honey flow.
5. ____ Pure orange honey produced in Florida, Arizona and California will be similar in chemical composition.
6. ____ Dark honeys normally have a more pronounced flavor and are higher in minerals than lighter honeys.
7. ____ Canola (rape) is an excellent source of nectar but the honey granulates very quickly in the comb.

(Multiple Choice Questions, 1 point each)

8. ____ A honey plant that is considered to be a noxious weed:

A. Milkweed
B. Loco-weed
C. Prickly pear
D. Yellow star thistle
E. Horsemint

9. ____ Mangrove honey is most likely to be produced in:

A. Montana
B. New York
C. Michigan
D. Florida
E. Texas

Please match the following varieties of honey with the appropriate characteristics, plant sources or geographical location. (1 point each).

A. Huajillo Honey, **B.** Avocado Honey, **C.** Clover Honey, **D.** Fireweed Honey, **E.** Citrus Honey, **F.** Alfalfa Honey, **G.** Mesquite Honey, **H.** Buckwheat Honey, **I.** Sage Honey, **J.** Sourwood Honey, **K.** Gallberry Honey, **L.** Palmetto Honey, **M.** Basswood Honey, **N.** Locust Honey, **O.** Canola Honey, **P.** Goldenrod Honey, **Q.** Tupelo Honey, **R.** Raspberry Honey, **S.** Cotton Honey, **T.** Thyme Honey, **U.** Tulip Poplar Honey

10. ____ Produces large quantities of dark red honey with a distinctive flavor.
11. ____ Honey with a strong minty flavor and odor produced by a tiny, shrubby mint with purple flowers in short clusters.
12. ____ Produced by a tree, honey is light in color and has a strong minty flavor.
13. ____ Produces light, mild honey and no other major honey plant grows further north than this one.
14. ____ Nectar is secreted both by the large flowers and by nectaries on the bracts beneath the flowers and by the leaves, producing a light colored, good flavored honey.
15. ____ A surplus of golden-colored honey, with a distinctive taste and odor are produced in the fall. Colonies take on a unique odor when working this floral source.
16. ____ White, mild flavored honey produced by one of the acacias in southwest Texas.
17. ____ These trees produce large quantities of honey in the swamps of the southeastern United States. The honey is of good quality and will not granulate.
18. ____ A straggly tree with long clusters of greenish flowers, producing light colored honey with a mild flavor in the southwestern United States.
19. There are seven different USDA color classifications for honey. Please name them. (7 points)

ANSWERS ON PAGE 46

A Late Winter Walk With The Bees

James E. Tew

The First Sting of the Season - No Different From Last Season's First Sting

Today was one of those perfect, late February Winter days. At 60° F and blue skies, it actually felt like Spring. Though I had not expected the day, I realized it would be great to take a walk with the bees without having to feel guilty about not doing anything other than just looking.

Bees were flying all about. There was a crocus in bloom here and there, but otherwise, it was just a warm Winter day. I didn't notice any pollen coming in.

Hefting the hives

I keep three hives in my backyard. You know the routine – "The cobbler's children always need shoes," but I'm happy to tell you that the bees were in pretty good shape. I lifted the colonies from behind. One was light, but I was expecting this and had saved a full deep of capped honey from last Fall in anticipation of this colony's late Winter needs.

The colonies were positioned in the shade making the area considerably colder than areas that were sunlit so bee flight was not particularly excessive.

The Sting

I popped the top on the first colony. I was only taking a quick look so why bother with a smoker and veil. One annoyed bee had other opinions. She stung me on my left thumb. It wasn't much of a sting, but I noted that it was my first sting of 2002 – nothing much to brag about. Now here's the rub – a few hours later, my thumb is red and a bit swollen. When I took the sting, I realized that I would have to re-acclimate myself to the upcoming season's frequent stings. In just a few weeks from now, such a sting will be inconsequential, but right now, so far as my physiology is concerned, I am a new beekeeper. I will need to begin to develop my seasonal resistance.

I accept stings as a beekeeping way of life, but that does not mean that I relish them. Quick as a snake, I rubbed the bee off and said a word that Mom didn't teach me. I rhetorically asked the bee why she had to do such a thing – a thing that cost her life and caused me physical discomfort. No answer was forthcoming, but I suspect that my cracking the top off the colony had a lot to do with it.

The only reason that I am reporting this to you at all is that each of us will have to go through the same procedure each season. It doesn't matter if you are in a warm climate and work your bees frequently or if you are in colder areas and spent entire months without being exposed to a sting. If you aren't stung for a few months, you will lose some or all of your resistance to bee stings. How much resistance and how many stings it takes to recharge yourself varies greatly between people. If you are new to beekeeping, I hope you realize that this is just a late Winter/early Spring rite of beekeeping passage. Though I was completely confident that nothing harmful would come of the sting, there is reason to watch the first few stings more closely that stings taken much later in the year.

Rattlesnake bites and beestings

At the 2002 Auburn University Spring Beekeeping Workshop, I talked with a beekeeper who had been bitten by a rattlesnake as he worked with his farm animals. As an aside, he described the great pain associated with the bite and admonished me to disregard all of the TV spots where people are bitten, tie the bitten area off with a bandana, and go on with their business. He convinced me that he was in instant excruciating pain and required more than a week in the hospital. Where we come into his story is that his first bee sting of this season resulted in a much greater reaction than he was accustomed to getting. His question, "Does a snakebite make one more sensitive to bee stings?" was lost on me. I don't know, but I was certain that he should take his question to an allergist for a professional opinion.

I grew up in rattlesnake country and spent my early years watching for them with each of my wilderness steps, always giving snakes a wide berth, but I never gave them more thought than that. Now, I must admit that I am even more cautious – realizing that I had not fully appreciated the risk of the snakebite experience.

Back in the beeyard

Though for most of you my present observations won't be useful until *next* Winter, I did note the common wintering beeyard happenings. For instance, I had a "normal" amount of dead bees in front of the colonies. What's normal and what's abnormal? A few hundred dead bees out front are actually a good sign that all is going well within the hive and that the colony is housecleaning itself very well. No bees out front at all or thousands of bees out front would not be good signs.

The warm day resulted in the smell of rotting bees wafting in the breeze, but better outside than inside the hive. All three colonies ap-

A well-defined cluster on a late Winter day.

Normal number of dead bees in front of a Wintering colony.

peared to be in pretty good shape in that regard.

Entrance Reducers

I correctly installed entrance reducers last Fall. Honestly, I have always wondered if I could remove them after Winter arrived. It seems to me that all self-respecting mice would have found an over-wintering location and the need to restrict the entrance had passed. Why would I even consider their early removal? Because they tend to hold dead bees within the hive. As I do every Winter, I considered removing them early, but just as I do every Winter, I left them in place to be removed in early Spring.

An unintentional upper entrance

As they so frequently do, flying bees had assigned themselves an unintentional upper entrance. While it was a popular entrance, many bees were still using the lower entrance. In years of heavy snow (so far, this definitely has not been a snow Winter in Ohio), flying bees frequently use the ventilation hole that I leave beneath the inner cover as a hive entrance. In fact, this hive had such a ventilation opening, but bees were not using it as an entrance.

I have no problem with the bees doing this, but invariably it means to me that there is an equipment problem with the hive. In this case, a rotted area was serving admirably as an upper entrance. The only time this could be a meaningful problem is when I move the colony. It's good to know from where to expect bees to exit the hive.

This is the light colony

This is the light colony to which I alluded earlier in this piece. While the other two colonies seemed to be nailed down, this colony freely rocked on its hive stand. I will get the extra deep put on this unit. It should make for a happy day within the colony when 40+ pounds of honey comes from nowhere to solve their immediate problems.

All in all, it was a good walk

All things considered, it was a good walk this afternoon. On all too many walks during Winters past, I have found dead or dying colonies – disappointing results. This year, all seem healthy with no excessive fecal spotting or large numbers of dead bees in front of the colonies. There were no surprises. All I need is more honey stores and I have that in waiting. The fact that I have had no Winter really can't hurt my wintering successes.

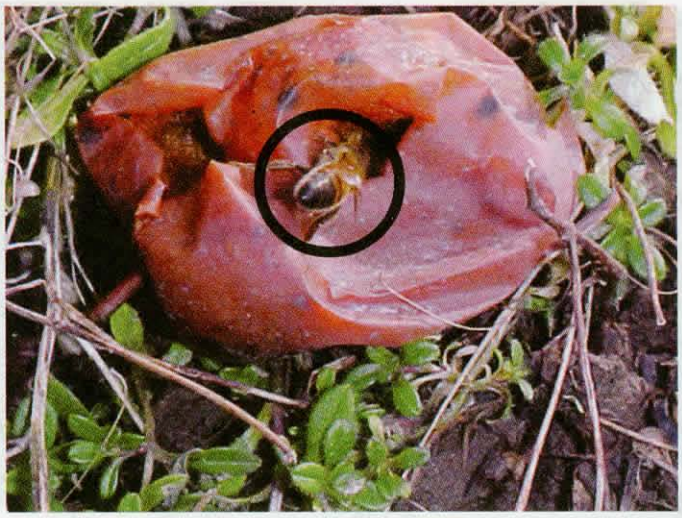
The return stroll

As I walked back to the house, I was aware of the Spring sound of buzzing bees. Closer observation showed significant numbers of for-

An entrance reducer doing its job in late Winter.

A bee exiting from an unintentional upper entrance – a rotted hole.

Continued on Next Page



A forager on a rotting apple in late Winter. I supplied the black ring.

agers on last Fall's rotting apple crop. I had seen this many times during late Fall when honey bees, yellowjackets, bumble bees and hornets all feast on the rotting fruit crop, but never this many bee foragers. Now, in late Winter, honey bees have the entire rotting crop to themselves. I can't answer my own question, "Are these bees picking up juice or are they eating decaying fruit pulp?" But in light of nothing else being available, they were readily foraging on this unusual late Winter food source.

I don't mean to harp

I don't mean to beat a dead horse, but I enjoyed today. I made meaningful observations and I didn't have to get all sweaty doing it. I saw bees foraging on rotting apples in late Winter – a first for me. In essence, I enjoyed my bees. I truly hope that you too have many such days throughout the year. BC

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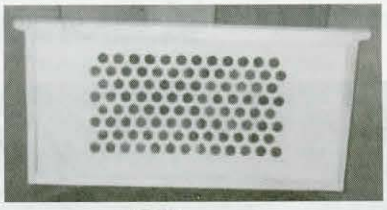

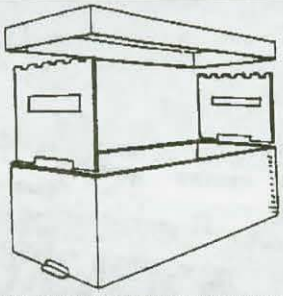

BETTER RECORDS
Mean Paying Less Taxes

Ann Harman

It's April! And the promise of Spring is in everyone's mind. We eagerly search for the crocus and jonquils and make great plans for the garden this year. However, "The flowers that bloom in the Spring, tra la, Have nothing to do with the case." (Gilbert & Sullivan, The Mikado) The "case" here is that April is also Income Tax Time. After struggling with taxes I found that I could have done a better job and also saved paying some tax money if only I had paid attention to what I was doing during the year.

Mind you, I am not a tax expert, but as a beekeeper trying to earn some money from my beehives I really could have been more aware of ways to save on taxes. Most hobbyists with a few hives really do not have a problem. The big commercial operations have already arranged their businesses to be organized and tax savvy. But sideliners can easily fall into the category of needing some ways to improve.

I suppose the first place to start is to improve record keeping. Many of us fall into the trap of saving little bits of paper, such as receipts, in inappropriate places: glove compartments of trucks, desk drawers filled with other clutter, the popular kitchen catchall drawer, and the ever useful shoebox where retrieval of information is difficult if not impossible. Receipts tossed on the dash of your truck tend to bleach out in the sun leaving you with a snippet of blank paper. What good is that?

It is so easy to toss that receipt into something at the end of a busy day. Six months later you do not have the foggiest notion what it is all about. So it was for $14.68. Not important? Well, enough of those and the sum does become important. The least you can do is write on the receipt what it really was for, what part of your business used that item.

Now what are we going to do with these receipts? I would like to suggest using a 3-ring notebook as a record keeping method. You may well ask why such an apparently cumbersome item. Well, it is difficult to lose a 3-ring notebook mixed in with all the beekeeping rubble. You can add and subtract pages in different places as your business changes. It is large enough to give you plenty of room for records and notes. And you can buy binder pockets to hold your receipts and other bits of paper. These binder pockets can be obtained at any of the office supply supermarts and are quite cheap. Now you can arrange your receipts into categories so that when tax time comes you are not trying to cope with a shuffled mound of paper.

It is interesting to note that the A. I. Root company sells an attractive record-keeping 3-ring binder for beekeepers. This has turned out to be a very popular item since the organizational work has been done for you. You can add those binder pockets to it so that the notebook has all your records in one place.

Their basic notebook comes with a set of dividers and a filler pack of individual colony management record sheets. To this you can add two separate packets of record sheets: One for mileage (gas, oil), sales requirements (bottles, labels) and sales records (amount of honey or wax and customer information), and another for equipment and tools (purchase information and depreciation). These sheets give you an excellent place to scribble information down right away before you forget. Then if you wish to transfer information to a computer file, you can do this at your leisure. The notebook can go with you to the apiary, to the honey house or in the truck, thus saving your computer from the hazards of truck travel and the stickiness of the honey house.

What sorts of receipts do you need to save? Fuel for your truck. Think of the many places you may be driving to: an outyard, delivering honey to customers, picking up package bees, going to the post office for some queens, going to the bee supply dealer, toll booth charges on the way to deliver honey or pick up supplies, driving to buy honey from another beekeeper, and checking on any retail outlets you may have. During this coming year pay attention to the numerous trips you take to do something connected with your business.

Receipts are absolutely necessary for equipment. How else can you take depreciation on your tax form for woodenware? However equipment means not only hives but also other items, large and small. Don't forget such things as cinder blocks for hive stands just because they did not come from a bee supply company. Smokers and hive tools are a part of your business so don't forget the little things. Did you buy sugar or HFCS or pollen substitutes to feed your bees? Don't forget medications for your colonies.

Receipts for repairs are also a part of your record keeping. Did you

Continued on Next Page

"This year, take charge of your record keeping, and save money next *year."*

RECORDS ... Cont. From pg. 43

have to buy a new heating unit for your wax melter? Or perhaps you needed to send a piece of equipment out for a repair you could not make yourself. Don't forget repairs to your truck – they can be expensive but help you save on taxes. Maintenance of your equipment is an important part of your business and one that needs receipts.

Have you given a thought to advertising and office supplies? Even if you printed up a few flyers or obtained a set of business cards, those expenses are a part of your business. Take advantage of those expenditures.

Some beekeepers have insurance on their operations. Those premiums are one of your business costs. So are any wages paid to someone you hired to help with some aspect of your operation.

Your memberships in beekeeper associations are one of your expenses of doing business. National, regional and local associations are considered educational and certainly contribute to your knowledge of bees and keeping bees healthy and productive. The treasurer of an association can provide you with a receipt for your dues and also for registration fees for attendance at a meeting. Other sources of professional information, such as books and magazines, are a part of your beekeeping business. Be sure you get a receipt for the books and any other information you purchase.

Taking an inventory of anything must be one of the more boring tasks of life. However, depending on your business, keeping inventory records may be important for your tax returns. Since depreciation occurs over a number of years, keeping information in that 3-ring notebook will help you take and keep inventory and calculate depreciation. That way you will have the information for next year and the years after.

Some records may be difficult, depending on the physical layout of your beekeeping business. If you have a honey house, however small, do you know what electricity costs for it? Or perhaps heating? Separate records for utilities for your business can help you with income tax calculations. If you have only one telephone line to your home you may wish to decide whether a separate business phone would be practical. Only you can decide whether your business calls would be profitable on a separate line.

Take advantage of depreciation. Generally woodenware can be considered to have a lifetime of 10 years. Yes, I know you are still using boxes your grandfather had. But for tax purposes 10 years would be the limit. You will probably have to estimate the lifetime of honey processing equipment but choose a sensible number of years. Keeping careful records on purchases will pay off in the long run.

This is the age of computers. If you happen to use a computer mainly for record keeping, writing business letters, making labels and other business related tasks then you need to keep records for such purchase expenses. If, however, it is a household computer and the kids spend hours playing games, it could not really be considered a business expense.

Is it possible to keep records on the computer? Certainly. However computers do not do away with the need for tangible pieces of paper that document what you are doing. Accountants want to see evidence of your business so they can do a better job of your tax. So would the IRS if a problem arises; they don't want to hear "the dog ate my homework" excuse. Computer programs exist for keeping track of expenditures and income. You can devise your own system for keeping track of your colonies, moving them, medications, production, requeening. Such information makes you a better business person and beekeeper.

Now that I have admonished you to keep better records in order to save you money and time I need to take a few minutes and see if I can find that receipt for frames and foundation. It's got to be here somewhere. Has anyone seen it? BC

Ann Harman is a sideline beekeeper and international marketing consultant.

?Do You Know? Answers

1. **False** Honey and honeydews are not identical in chemical composition. Honeydew is a sweet liquid excreted by Hemipterous insects, principally aphids and scale insects feeding on plants. Honeydew in comparison to honey is lower in glucose and fructose, darker in color and higher in pH, higher sugars, acidity, ash and nitrogen. The sugars of stored honeydew appear to be even more complex than those of honey, perhaps since two sets of enzymes, those of the hemipterous insect and of the honey bee, are involved in honeydew stores.
2. **False** Heather honey is unique because of its property known as thixotropy, which is a decrease of viscosity following stirring or agitation which then returns on standing. Heather honey is dark in color, a deep amber, strong in flavor and almost impossible to extract with the honey extractor. Heather is a very important honey plant in Europe, but only occurs a few places in North America. No American honey has to any marked degree the property of thixotropy.
3. **False** The honey property known as thixotropy which is associated with heather and manuka honeys is due to the presence of a specific protein. The property is lost when the protein is removed. Clover honey becomes thixotropic when the protein is added to it.
4. **False** Honeys from the same plant source are generally lighter in color when produced during a fast and heavy honey flow than when they result from a slower honey flow. Orange blossom honey is one that shows great variation in this regard.
5. **True** The chemical composition of honey from a single flower source will be similar regardless of the geographical area of production. While the moisture content will vary from one region to another in relation to relative humidity, the nectar sugar composition will be *similar.*
6. **True** Light-colored honeys are generally milder in flavor and have a lower mineral content.
7. **True** Canola, which includes both Argentine and Polish types of rapeseed are excellent nectar producers and potential honey sources. The honey, however, crystallizes rapidly in the comb before the beekeeper has a chance to extract it.
8. D) Yellow star thistle
9. D) Florida
10. U) Tulip Poplar Honey
11. T) Thyme Honey
12. M) Basswood Honey
13. D) Fireweed Honey
14. S) Cotton Honey
15. P) Goldenrod Honey
16. A) Huajillo Honey
17. Q) Tupelo Honey
18. G) Mesquite Honey
19. Water White, Extra White, White, Extra Light Amber, Light Amber, Amber and Dark Amber

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

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

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Tracking The Sun

This chart can be used to track the apparent motion of the sun in the sky throughout the year. Look at the article on **Page 27, *A Sunny Disposition***, for an explanation.