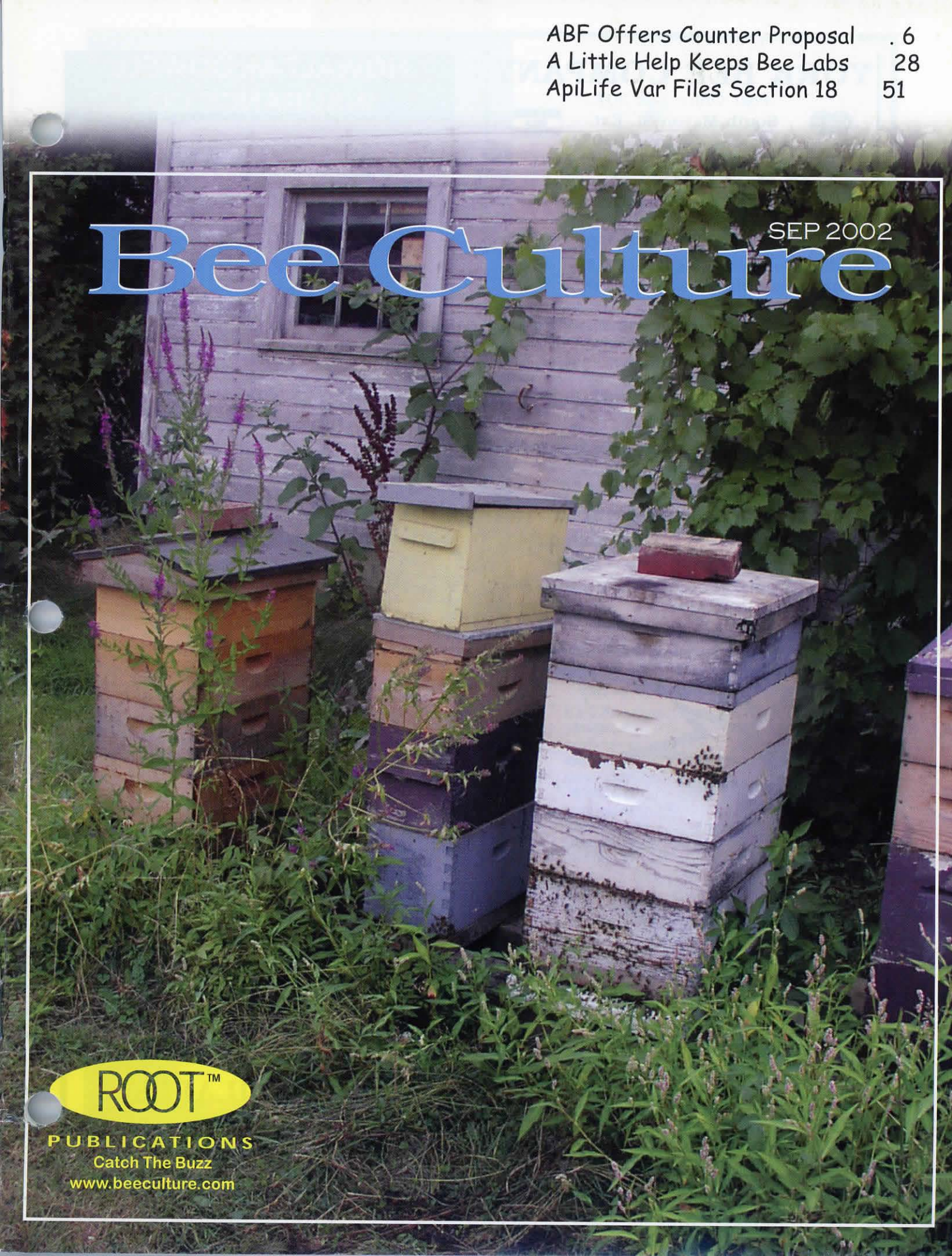

Bee Culture

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

SEPTEMBER 2002 VOLUME 130 NUMBER 9

FEATURES

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September morn in an overgrown beeyard, with loosestrife and smartweed and grapevines galore.
photo by Kim Flottum

DEPARTMENTS & COLUMNS

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MAILBOX

The U.S. Mail & More

I just received the current issue of *Bee Culture* and was flabbergasted when I saw the article about removing bees from the wall of a house. I am facing this daunting challenge over the next few weeks, so the article was very timely. Thank you very much.

I will also be writing a letter to the Postmaster General in Washington complaining about the service of the U.S. mail. I feel like I pay good money for your magazine, (no complaints here) and even more good money for the U.S. mail to deliver the magazine to me at my home address. The current issue came to me missing the back cover. This is not the first time nor is it the only thing that has been torn or otherwise damaged when it was delivered to me. I will be writing the Postmaster General telling him/her what I think of the U.S.P.S.

Thanks for a great magazine.

Louis Burnette
Jasper, AL

Defensive Drones

I've noticed that when working hives, drones are sometimes the first to buzz around my face and person. This is a little unnerving until one realizes they're harmless. Has anyone ever wondered if this noisy show could be a defensive ploy to deter would-be predators?

Thanks.

Mike Hater
Bloomington, IN

Good Riddance F&V

The Industry Roundtable held in Chicago in May yielded some interesting proposals. A mostly overlooked proposal is to shift oversight responsibility from the Fruit and Vegetable Division of the Agricultural Marketing Service to the Livestock and Seed Division. The industry will be well served by making the move.

Any former Chair or Executive Committee member, or Board member who was paying attention can give you a list of good reasons to switch.

Here are five reasons the industry should move from F&V.

1. Blown Budgets. When I was a Board Member, one dust up occurred over the fact that F&V had failed to budget costs for the continuing referendum in 1996. It was a $25,000 budget overrun. F&V, having no accountability to the industry, unilaterally took the money, and then lectured Honey Board for not having adequate resources for contingencies.

2. Inaction. On *several* occasions, Board Members could not be seated because F&V had failed to get the nominees approved by the Secretary of Agriculture. Nominee's names were submitted in October: *eight months* prior to the June meeting, when new members were seated. Several times, entire regions were not represented because F&V had failed to get their work done.

3. Turnover. Over the first 15 years the Honey Board has existed, Martha Ransom managed run off THIRTEEN Marketing Specialists assigned to NHB. Imagine your business is a $3 million enterprise.

Now imagine the chaos and loss of changing managers thirteen times in fifteen years. Your business would fail. F&V has failed this industry.

4. Incompetence. I have been in meetings when the Division Chief and her superior insulted the Comptroller of the Honey Board with their own ignorance of fundamental budget terms and analysis. Do you know the difference between a reserve and a carryover? F&V does not. We do.

5. Hostility. Do you know the F&V Division now presumes to approve contracts between scientists researching light spectroscopy reactions in honey and the food scientist staff member for the Honey Board? F&V knows nothing about light spectroscopy, and neither do I. Common sense favors hiring trained, competent scientists to set the bounds of research.

F&V now presumes to approve photography of honey for publications.

F&V knows nothing about photography. Neither do I. To market U.S. honey in the Middle East and in domestic Hispanic markets, the Honey Board hired professional translators to translate existing promotional materials for both language and culture. F&V needed to approve these. No one in the entire division is proficient in any language other than English. Common sense dictates that to get professional results, you get a professional, not a bureaucrat. The bureaucrats are doing it now, and like the lost nominations, weeks, months pass waiting for action from the inactive.

The exchange at the last Roundtable summed it up best, when the proposal was made to change from F&V to L&S; the AMS representative said, 'Fine, go. I don't want to waste any more of my money on you people. Nick Sargeanston said it best in reply, 'Excuse me, sir, I believe that is our money you are referring to.

Here is the bottom line. The Fluid Milk programs generated about $350,000,000 in 1998 assessments. That same year, Honey Board assessments were about $3,500,000. Dairy paid $525,000 for oversight from L&S. Honey Board paid about $125,000 for the same oversight. Dairy's revenue was ONE HUNDRED TIMES Honey Board's. Oversight was about $400,000 more for $346,500,000 more spending. It is unreasonable for the industry to stay at F&V. It is a very reasonable proposal to go to L&S.

John R. Miller
Gackle, ND
John is a former NHB Chairman

ABF Offers Counterproposal To Packer-Importer Honey Board

The American Beekeeping Federation, in response to the packer-importer controlled Honey Board favored by packers, importers and the AHPA, offers the industry a producer-protective counterproposal: a National Honey Board that preserves equitable producer representation and protects producer interests in honey promotion.

Like the packer-importer proposal, which was endorsed by most of the industry during a National Honey Board-sponsored Industry Roundtable in Chicago in May, the ABF proposal would have the current Honey Board cease operations and a newly-organized board take its place. Unlike the packer-importer proposal, the ABF proposal includes significant protections for the interests of U.S. honey producers.

"Producers' voices and interests were being ignored in the packer-importer proposal," said ABF President Pat Heitkam. "We are proposing a positive alternative to address the issues which have been raised about the current honey Board without sacrificing the interests of American beekeepers."

The ABF proposal calls for:

Assessments to be paid by importers and packers – as does the packer-importer proposal.

At least one producer to be a member of the board's executive committee and/or an officer.

At least one producer must be present to constitute a quorum of the board.

Producer members must constitute at least 50% of the board members. The packer-importer proposal would give producers only two of nine board seats.

At least 8% of board's total revenue must be set aside for production research and available for other (emergency) needs only by a unanimous vote of the board.

A simpler nominations system with each qualified organization submitting nominees for board positions and alternate positions, which represent that organization's segment of the board.

An assessment threshold of 100,000 pounds. The packer-importer proposal calls for a threshold of 250,000 pounds, which would reduce the assessment payers from the current 3,500 producers and importers to about 100 importers and packers.

Provisions for promotion of domestic honey. The ABF proposes that the new board be directed to promote domestic honey with assessments paid by domestic honey and to promote honey generically with assessments paid by imported honey.

Lastly, the ABF proposes that the producers and importers who are paying assessments to the current Honey Board vote to determine whether the current Honey Board is to be terminated and its activities and property turned over to the new board.

"We have a lot of questions to be answered before we form a new board," says ABF President Heitkam. "While a sense of urgency pervaded the Chicago Roundtable, we feel the urgency was forced on the group in Chicago by the AHPA saying they intended to continue pursuing their course of destroying the Honey Board, as we know it, and the importers saying they had had enough and would vote against the Honey Board if AHPA forced a new referendum. By the timelines provided by USDA-AMS, it will take years for the AHPA case to reach a conclusion. In the meantime, if AHPA decides to mount a petition drive and force a new referendum, we would be happy to cross that bridge at that time.

"From our surveys of the industry, we feel that producers, if faced with a choice between the current NHB and a packer-importer-controlled board, will favor the current NHB by a far broader margin than they did in the February 2002 referendum.

"Our hope is that when the dust settles from this controversy, all the industry's efforts will have resulted in a workable honey board, which can ensure that honey is protected and promoted," Mr. Heitkam concluded. "A separate, but equal, goal of ours is that all segments of the industry are treated fairly in this process. We hope the rest of the industry shares these goals."

from the American Beekeeping Federation

INNER COVER

Across Liberty street from the building where our magazine staff, accounting, order entry and the sales people sit in extreme air conditioned comfort all summer, lies our very large, and very hot candle factory.

Twenty four hours a day, five days a week hundreds of people do all that's needed to make the millions of candles that pour out the loading dock, day in and day out, every day.

I wander over there sometimes, abandoning my cool and quiet office. Friends are there. Meetings, with purchasing or receiving get me there, and visits to the outlet store where bee supplies and honey are sold take me all the way over there.

To get to the meetings, the store or the rest I walk the length and breadth of the factory floor. Once past shipping, I walk well defined isles, past conveyers and presses and filters. Past mixers and blenders and boxers and new machines on all sides that I can only wonder about.

At every station good people are making hot wax into candles, labeling and sorting and inspecting, then packaging and moving them away. Hot wax and hot machines are everywhere, wherever you look. Fork lifts scurry, carrying finished goods away, bringing raw material back and beep, beep, beeping their way through the maze, so more can be made without a pause. And all the while the clank and hiss and rumble and roar of all the machines at once hangs in the air, pressing your very soul. Adding to the cacophony giant floor fans rush super-hot air across the isles and the machines and the people. Walking through their storm is a hot shower without the water. Scattered all about the factory floor giant tubs with ice and bottled water sit in their own sweat puddles, offering wet relief between breaks for the hot, hot people who make all this happen.

Far above, monstrous roof fans suck the hot factory-floor air away as it rises above the machines and the conveyers and the people. But as fast as it moves away, more is made below. It's hot on the factory floor and there is no respite, no relief, no escape in the summer time.

Halfway between the floor and the ceiling looms the mezzanine, which hovers over a portion of the hot wax and candles and the hot people who make them below. The hot air from this covered factory floor rises and coats the bottom side of the mezzanine, warming it the same as the hot wax below. This air doesn't move, isn't sucked away, and it soaks into the concrete all day, all night.

The mezzanine is an engineering marvel. It holds the hundreds of stainless steel, bowl-shaped wax melters that feed the hundreds of candle making machines below. Each with a thousand pounds of candles-to-be, is fed by hand with blocks of wax to be melted and mixed with exacting amounts of dye and fragrance for the alchemy of perfect candles made below. This magic mix moves through a mystery maze of pipes and pumps and valves and gates, each to its destined machine below, warming all it touches and passes by.

Melting pots wear coats to keep their precious heat but some always escapes from each. No ceiling fans move the heat from this floor, from the tanks or from the hot, hot wax. In the summer time it's a hundred by dawn. By noon a hundred and twenty. There's a hellish heat on the mezzanine.

When the candles are made and done below, the wax remaining in the melting pots is drawn and decanted into plastic molds to cool to store away. These waxen blocks are piled on pallets and sit and wait for future use, sandwiched between the hot, hot melting pots out of the way. Pallets and pallets, each with 30 or 50 or more blocks of wax, like Leggos piled together, different colors, different sizes, different smells.

This July, when the hot summer days had gone on for weeks, only the brave and the necessary people go to the mezzanine. They fill the tanks, fix the valves and retrieve the pallets needed below. And they don't linger long on the mezzanine, in July.

But on just such a day I had to go to the mezzanine. Each step up the narrow stairs pushed up the temperature and at the top, as I looked down the rows the air shimmered up like in a mirage, but this was real. It was harder to breath, sweat came fast and my glasses fogged on the edges.

What caught my eye, what made me look, were the blocks of wax that had once been stacked all neat and straight and tall. Those on the top that were highest up all ran together in the middle and were oozing over the sides. And every block on every pallet was wider and shorter than it once was, filling every space between and to the edges. They looked relaxed, even tired.

Like a Dali painting with dripping clocks, these blocks of wax had come alive in the heat that didn't move and didn't change Those piled nearest a melting tank escaped from the bottom between the slats, on to the floor all heading toward the isle. Amoeba-like they had crawled away, heading for ... even warmer places? They weren't there yet, so it's hard to know.

I made my way to the beeswax room to see how much was there. Beeswax is hardy stuff, tougher than those sagging paraffin blocks of fancy colors and smells. Those beeswax blocks stood proud and solid and tall. Eager to be better than all the rest. *They* were the measure for this heat.

As hot as it is when we work our bees mind those who work on the mezzanine, moving things and fixing things and filling again and again the hot, hot tanks of hell.

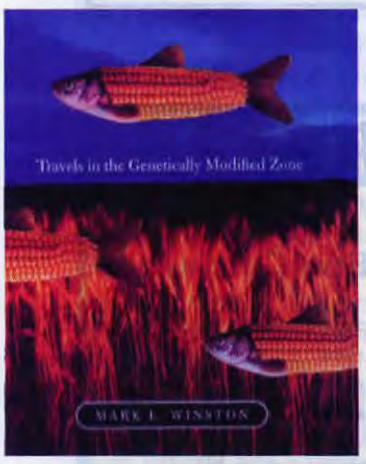
Enjoy the breeze, the spot of shade and the most wonderful smell of being outside that's always in the air.

Kim Flottum

Hot Time, Summer In The Factory

New Books

Travels In The Genetically Modified Zone. Mark L. Winston. Harvard University Press. ISBN 0674008677 280 pages, $27.95



With genetically modified crops we have entered uncharted territory – where visions of the triumph of biotechnology in agriculture vie with dire views of medical and environmental disaster. For two years Mark L. Winston traveled this fraught territory at home and abroad, listening to farmers, industry spokespeople, regulators, and researchers, canvassing high-security laboratories, environmentalist enclaves, and cyberspace, making a thorough survey of the facts, opinions, and practices deployed by opponents and proponents of transgenic crops.

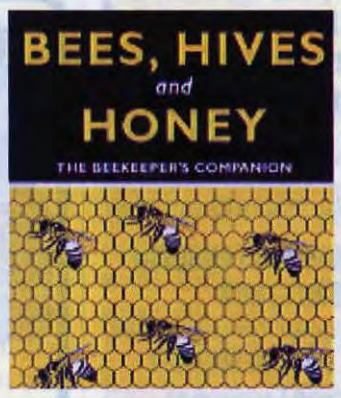
Through his sympathetic portrayal of the passions on all sides, Winston brings a clear, unbiased perspective to this bewildering landscape. Traveling with Winston, we see the excitement and curiosity that pervade laboratories developing genetically modified crops, as well as the panic and outrage among dedicated opponents of agricultural biotechnology; the desperation of conventional farmers as they look to science for solutions to the problems driving them from their farms, as well as the deeply held values of organic farmers who dread the incursion of genetically modified crops into their expanding enterprise. And, Winston shows us, these contrasting attitudes transcend national borders, with troubling counterparts and consequences in the developing world.

As he seeks a middle ground where concerns about genetic engineering can be rationally discussed and resoled, Winston gives us, at long last, a full and balanced view of the forces at play in the chaotic debate over agricultural biotechnology.

Mark L. Winston is Professor Biological Sciences and a Fellow in the Morris J. Wosk Centre for Dialogue at Simon Fraser University, Burnaby, British Columbia. He is a regular contributor to this magazine.

From the Publisher

Bees, Hives and Honey. The Beekeeper's Companion. Published by The Federatin of Irish Beekeeper's Association. Edited by Eddie O'Sullivan. 231 pages, B&W and color. $19 Euro. Postage extra.

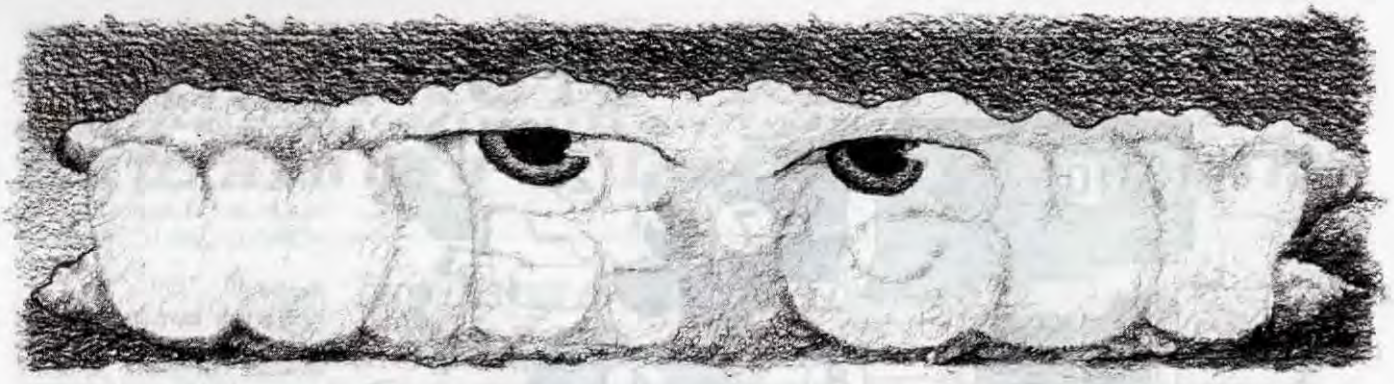


I've been reading the official journal of the Irish Beekeeper's Association for as long as I've been at this desk. It is a small but worthwhile journal that covers the beekeeping industry in that country. It has several contributors I routinely read, and others who, like this journal, come and go.

In 2000 the group of all the Irish Beekeeping Associations published a how-to book for their members. It's all about beekeeping in Ireland. Which is, I admit, a bit different than here. Not significantly, but enough to be more than interesting.

There are 21 chapters and a decent glossary, and eight or so authors covering everything from Irish History to showing honey. And, since I'm hoping to travel there when they host Apimondia in 2005, I'll be ready, now that I've read the book.

Contact Eddie O'Sullivan, St. Ives, Kilcrea Park, Magazine Rd., Cork, Ireland. Phone 00353.21.4542614 or eosbee@indigo.ie.



Blending honey. Why do you think packers blend honey? To try and make a better product? To make a consistent, average product? Or, to increase profits? It looks to me as if the last two are the winners. If blending is a good thing I believe I should mix my, no I mean *blend* my melter honey with my good stuff to make an average product that will increase *my* profits.

I sometimes laugh when I read that our industry's number one goal is to protect the wholesome image of honey. When marketers take good domestic honey and blend it with fowl tasting Chinese honey to make a blend so that they maximize profits, do they really want to protect honey's image?

A few years ago there was a court case on adulteration of honey with corn syrup. The packer was found not guilty. The industry, before the trial, was up in arms about this happening and if found guilty wanted some harsh justice. Chinese honey is no better than corn syrup (and probably worse). And most domestic producers I know feel that when you blend good domestic honey with Chinese honey you are actually adulterating the product just as if you had added corn syrup. Now, Chinese honey has been found to contain an illegal antibiotic. This antibiotic is very strong and can have a very adverse affect on some people. Unknown to me until recently another illegal pesticide, that you cannot purchase or use, was found in some deliveries of Chinese honey. I've heard rumors that at least some honey buyers knew about this but weren't inclined to pursue the problem, or do anything to stop it. These are the same people that wanted you and I to sign a contract that said *we* were responsible for any contamination our honey had with any chemical or drug found if tested. I assume the Chinese signed the same contract.

As long as honey blending is done all we will see, at best, is an average product. We need to stop blending and have products that stand on their own. Some honey will naturally be worth more, plus if you can develop a market for certain varieties you can create a higher price for that product.

A good marketing example is Iced Tea. Look at what you now can buy – sweet tea, unsweetened tea, lemon iced tea, sweet lemon tea, raspberry tea, sweetened raspberry tea, peach tea, on and on and on. Two years ago there was one choice. Now, look at our aisle – Clover honey, something looks like wildflower, raw honey, and mountain flower – they all look alike. Now, when you and I extract our honey not only is the appearance different but the *taste* is different. But through the magic of blending it all tastes the same and it all looks the same.

If you look at where our industry is I believe we are at about the same point as when Henry Ford started building cars. He said, "I will build cars the color the public wants, as long they want black."

Wise Guy

SEPTEMBER – REGIONAL HONEY PRICE REPORT

Region 1
Prices down a bit this month at bulk, pail and retail, but moving up at wholesale. Bumper crop predicted almost everywhere of medium light to lots of light.

Region 2
Bulk and wholesale steady, pails and retail off a little. About an average crop so far, with lots of light and some medium showing up.

Region 3
Bulk and pails up from last month, while wholesale and retail steady. Mixed crop so far, some way up with dark, others down with light.

Region 4
Prices pretty steady across the board, but Summer retail prices a bit lower. Steady average crop so far, with mostly medium and dark showing up.

Region 5
Pails and retail prices up, while bulk steady and wholesale down. About average crop, but maybe a bit darker than usual.

Region 6
Prices steady, but bulk up a notch. Crop is average to a bit down across the region, but color is all over the map. Lots of dark, but lots of light.

Region 7
Pails and bulk prices up, wholesale and retail steady, but even there a bit higher. A good to better than average crop so far, with lots of light in the barrel.

Region 8
Bulk prices up, pails and wholesale steady but retail off a bit since last month. An average to a bit less of mostly light crop so far.

Region 9
Pail prices have dropped, but bulk, wholesale and retail all are up since last month. At best a barely average crop of mostly medium and medium-dark expected.

Region 10
Bulk and wholesale prices up, retail steady but pail prices down. Less than average crop expected, and enough medium showing up to note.

Region 11
Bulk and pail prices down since last month, wholesale and retail steady to up a bit. Crop way down for many, and mostly medium color being made.

Region 12
Bulk prices up, the rest steady since last month. North crop mostly below average, south crop mostly (but not quite) non-existent, so far.

Using This Chart

The numbers for each commodity (for instance a 1 lb. jar, retail) fluctuate each month in each region. You can track these in your regions, and over time you will note the trends taking place. But each number is generated by averaging the recorded price of from 10-30 reporters, often in several states. To see what's happening on a more immediate level, study the three columns on the far right side. What is the average price this month? Last month? And same month last year? Tracking these prices over time provides an excellent indicator of honey price trends, and will serve you well, especially when you compare to your local trends.

	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)	77.50	70.70	81.87	68.33	81.87	75.00	74.17	75.00	80.00	69.33	89.40	75.00	68.33-89.40	76.51	78.50	67.49
60# Amber (retail)	70.33	66.19	70.00	67.50	76.82	73.50	70.67	66.00	75.00	66.25	86.50	70.00	66.00-86.50	71.56	71.67	66.86
55 gal. Light	0.75	1.05	0.84	0.84	0.91	1.01	1.00	0.94	0.95	1.00	0.81	0.80	0.75-1.05	0.91	0.87	0.65
55 gal. Amber	0.70	0.75	0.85	0.79	0.85	0.96	0.93	1.00	0.79	0.79	0.75	0.80	0.70-1.00	0.83	0.78	0.65
Wholesale - Case Lots																
1/2# 24's	40.36	36.92	34.00	31.76	36.22	27.50	26.41	36.22	36.22	39.13	34.00	36.22	26.41-40.36	34.58	33.72	30.16
1# 24's	59.44	41.10	55.00	45.96	54.21	51.00	47.57	47.76	45.00	52.33	53.27	39.30	39.30-59.44	49.33	47.84	43.85
2# 12's	48.96	37.14	48.70	43.52	48.70	40.00	35.71	45.00	46.50	41.55	46.50	45.00	35.71-48.96	43.94	42.39	39.02
12 oz. Plas. 24's	48.00	44.54	53.00	36.97	49.05	44.00	39.02	45.60	42.00	46.77	46.50	40.80	36.97-53.00	44.69	40.64	36.07
5# 6's	49.83	41.41	53.76	45.68	53.76	43.50	42.67	53.76	53.76	44.40	50.00	53.76	41.41-53.76	48.86	48.30	42.87
Retail Honey Prices																
1/2#	1.87	1.56	2.40	1.97	1.59	1.83	1.72	2.21	2.18	2.15	2.63	2.18	1.56-2.63	2.02	2.16	1.81
12 oz. Plastic	2.57	2.18	2.10	2.35	2.50	2.49	2.20	2.52	2.80	2.35	2.80	2.32	2.10-2.80	2.43	2.50	2.39
1 lb. Glass	3.29	2.48	3.50	2.83	2.70	2.93	2.50	3.12	2.87	2.60	3.70	3.05	2.48-3.70	2.96	3.05	2.76
2 lb. Glass	5.83	4.16	4.94	5.15	3.59	4.76	3.80	6.27	5.92	4.43	4.38	4.97	3.59-6.27	4.85	4.84	4.54
3 lb. Glass	7.00	5.85	9.00	8.33	6.75	6.63	6.29	7.66	8.33	6.70	6.39	6.19	5.85-9.00	7.09	7.04	6.09
4 lb. Glass	7.50	6.09	8.72	9.56	8.72	8.25	7.74	9.69	8.72	8.72	9.25	8.72	6.09-9.69	8.47	10.68	7.74
5 lb. Glass	12.13	9.18	8.58	11.15	10.00	11.00	9.43	8.89	8.58	8.09	8.33	8.58	7.75-12.13	9.50	10.96	9.47
1# Cream	4.00	3.08	4.00	2.98	4.51	3.33	3.24	3.24	5.00	3.21	4.74	3.17	2.98-5.00	3.71	3.80	3.15
1# Comb	4.75	3.76	5.00	4.08	5.06	4.17	17.00	4.99	5.06	5.06	6.67	4.50	3.76-17.00	5.84	4.61	4.29
Round Plastic	3.63	3.57	4.00	4.65	4.19	3.75	4.07	3.99	4.19	4.19	5.05	3.50	3.50-5.05	4.06	4.05	3.67
Wax (Light)	2.19	3.02	4.00	1.83	3.33	2.22	1.60	3.25	3.50	3.45	1.77	2.50	1.60-4.00	2.72	1.96	2.05
Wax (Dark)	1.93	2.60	4.00	1.78	2.92	2.07	1.60	2.75	5.00	2.38	1.86	2.00	1.60-5.00	2.57	1.40	1.14
Poll. Fee/Col.	43.80	40.67	48.00	45.00	30.00	41.00	36.00	40.50	41.00	41.00	49.00	34.00	30.00-49.00	40.83	38.47	38.48

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

"Timing is not everything . . . but it is a lot"

The spread of African-derived honey bees (AHB) from Brazil to other areas of South America, then northward to Central America and North America is a well-known story. Following the initial detection of feral swarms in Texas in 1990 and the subsequent spread of AHB through the southwestern U.S., media attention appears to have waned. However, more than a decade later, research on the process of Africanization continues as scientists seek to understand the genetic interaction between bees of African and European origin in the Americas. Recent progress in this area was reported by Quezada-Euan and May-Itza (2001). These authors report the results of field experiments designed to study the honey bee mating process and drone congregation areas in southern Mexico.

Mating of virgin honey bees takes place in flight within "drone congregation areas" (DCA's). DCA's are composed of daily flight associations of drones from local colonies and the locations are often relatively stable from season to season. Quezada-Euan and May-Itza took advantage of this stability and set up two experimental apiaries, close to a known DCA. They randomly distributed 20 colonies of African-derived honey bees and 20 colonies of European-derived honey bees between the two apiaries. Each colony contained a frame of drone comb for drone production and all extra drone comb was removed, in an effort to keep the overall amount of drone comb equal in the two colony types. The researchers then collected drones from the nearby DCA throughout the season using a special trap baited with synthetic queen pheromone and a "dummy" queen. They sampled the DCA with the drone trap twice a month and froze the drones for later analysis.

Back in the laboratory, the researchers analyzed 60 of the drones collected each month for genetic "markers" that could be used to help distinguish whether they originated from the European or African-derived source colonies. The two most useful markers were variants in the enzyme hexokinase (HK) and within the mitochondrial DNA. For HK, there were two such variants or "alleles" of interest. The form commonly found in most European honey bee subspecies is Hk^{100} (HK1), while allele Hk^{87} (Hk2) is more common in African-derived honey bees. Similarly, two variants of mitochondrial DNA (known as haplotypes) were detected that could be used to help distinguish European and African-derived honey bees. For simplicity – the haplotypes were referred to as "A" (African-derived) and "E" (European-derived).

The analysis of genetic markers in the sampled drone populations demonstrated that there were statistically significant differences between the types of markers found in the DCA over time. In March, Hk1 was found in a frequency of about 20% within the DCA, while the type common in AHB, Hk2, occurred at about 80% frequency. Similarly, the "A" mtDNA variant commonly found in AHB occurred in about 80% of the drones collected in March, while the E haplotype was found in the remaining 20%. However, by July the situation was almost exactly reversed. Within the drone populations collected during July, the typically European-derived Hk1 allele occurred in a frequency of 81% and the "E" mitochondrial haplotype occurred in 77% of the drones collected. Thus, over the season there was a demonstrable shift in the peak periods of drone production between the two colony types, as measured by participation in the drone congregation area. While the authors did not directly measure differences in drone production within the colonies or association of the inferred shift in drone production with peak periods of queen production, they cite previous scientific literature that suggests that AHB colonies produce their drones earlier in the year than European-derived bees. Based on this previous work, they hypothesize that "it is likely that African-derived honey bee colonies may produce queens earlier too and thus mate with African-derived honey bee drones..."

The authors conclude by suggesting several practical applications of their findings for queen rearing and the maintenance of European-derived genetic stocks. One such idea was for beekeepers to work to decrease drone production in AHB colonies while simultaneously striving to increase it in European-derived colonies. Presumably this would be in areas where beekeepers maintained apiaries with both types of bees. They also suggest that the timing of queen production may be adjusted to later in the season to increase the probability that the queens will mate with European-derived drones that predominate at that time. While this study was limited to one specific area in southern Mexico, it is obvious that the results have a lot of potential for application to areas outside the study site. The details of the timing will undoubtedly vary according to specific geographical and ecological situations, but the principle of understanding and then using genetically-based differences in mating behavior to improve control of the breeding process remains sound. BC

Quezada-Euan J.J.G. and W. J. May-Itza. 2001. *Partial seasonal isolation of African and European-derived* Apis mellifera *(Hymenoptera: Apidae) drones at congregation areas from subtropical Mexico.* Ann. Entomol. Soc. Am. 94:540-544.

Mark Winston

Poison Honey

"Just as honey analysis is revealing illegal pesticides and antibiotics, it also can reveal trace amounts of potentially harmful natural substances."

It's not unusual for readers to send me weird articles, odd musings, and occasionally some very strange thoughts after reading one of my pieces in *Bee Culture*. Sometimes, though, a reader will send something completely normal to point out a perspective I may have overlooked. This month's column was inspired by an article sent to me by Eric Mussen from the University of California about poison honey.

I presume Eric was responding to June's column about antibiotic residues in honey by gently reminding me that honey can naturally contain undesirable compounds. The article he sent was titled "Honey from Plants Containing Pyrrolizidine Alkaloids: A Potential Threat to Health," by John Edgar, Erhard Roeder, and Russell Molyneux (Journal of Agricultural and Food Chemistry 2002, 50:2719-2730). The three authors, from Australia, Germany, and the United States respectively, discussed honey that naturally contains minute but potentially harmful levels of pyrrolizidine alkaloids (PA's), toxic compounds already regulated by many governments because of their presence in herbal medicines.

Naturally toxic honeys have been known from the earliest historical records, and were reviewed by Eva Crane in her 1975 book *Honey: A Comprehensive Survey*. The main culprits are honeys from several species of Ericaceae, especially some rhododendrons and azaleas, and honey produced from honeydew secreted by scale insects feeding from a particular plant in New Zealand (*Coriaria arborea*) and collected by bees directly from the insect secretions. The toxic substances have been identified and labeled with complex chemical names, but fortunately fatalities are rare and poison honey is not a mainstream problem for beekeepers and honey lovers from most parts of the world.

Honey containing PA's, though, is a bit different, because the explosion of herbal medicines world-wide has increased the probability that the combined dose delivered by taking herbal medicines and eating honey together might be problematic. PA's on their own are not highly poisonous, but our livers metabolize them into substances that are toxic enough that government regulatory agencies have set relatively low human tolerances for PA's themselves. The upper limit is one microgram per day, with ingestion restricted to six weeks per year. The acceptable limit is set even lower at a tenth of a microgram per day if ingestion occurs for more than six weeks. The authors of the honey study examined a number of honeys world-wide, and reported that many of them contained levels of PA's well above the maximum allowable dose.

Today's global consumer trend towards the use of naturopathic medicines and self-prescribed herbal remedies has had the unfortunate side-effect of increasing the ingestion of natural but toxic substances. Many plants considered to be medicinal contain compounds that repel or poison insect and vertebrate herbivores, and some of these plant-protecting substances also are toxic to humans. Low doses of herbal remedies may have benefits in treating illness or promoting wellness, or at least not have harmful effects in spite of these toxins. Unfortunately, dose can be highly variable in over-the-counter health store products, and unwitting users of naturopathic products may consume herbal medicines that can pack quite a toxic wallop.

This is not a trivial problem. Edgar, Roeder, and Molyneux report in their paper that the International Programme on Chemical Safety, a consortium including the United Nations Environment Programme, the International Labor Organization, and the World Health Organization considers PA's to be a threat to human health and safety. Their presence in food such as grains, milk, meat, and eggs along with herbal medicines can result in liver damage and death when the dose limits are exceeded. Progressive liver dysfunction can result from even brief, low-level exposure to PA's, and they may act in concert with other toxins and viruses to cause human liver cancers. Fetuses and infants are particularly susceptible, and some European governments require herbal products containing PA's to be labeled "Not to be used in pregnancy and during lactation."

Quite a few plants considered to be major sources of honey by

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"Quite a few plants considered to be major sources of honey by beekeepers contain PA's in their nectar, most significantly common borage, Paterson's curse, tansy ragwort, lavender, and comfrey."

beekeepers contain PA's in their nectar, most significantly common borage, Paterson's curse, tansy ragwort, lavender, and comfrey. These and other PA-containing plants have been introduced around the world and some have become serious weed pests, partly because the herbivores that evolved to overcome the plants' chemical defenses in their native territories have not done as well when introduced as biological control agents. Thus, populations of these weeds explode and in their abundance they often produce a considerable honey crop.

How high are PA levels in these common weeds? Previous studies have found PA concentrations of several micrograms per gram of honey, so that consuming even a fraction of a gram of honey each day would exceed the maximum allowable daily dose of one microgram if eaten daily for six weeks. For those eating honey every day, the amount of allowable honey would be even lower, considerably less than the volume of even a small raindrop. For perspective, school aged children consume up to 60 grams of honey a day and adults up to 93 grams, so even moderate honey consumption of unifloral PA-containing honeys would present a measurable risk of chronic liver disease, although immediate fatality would be unlikely.

The level of PA's in these honeys can be high enough that even blending with other honeys exceeds acceptable limits. For example, Edgar and co-authors point out that if a blended honey contained only 1% of a typical PA honey, the maximum allowable amount per day of that blended honey would still be only five grams. In practice some blended honeys contain much higher percentages of honey with PA's, since beekeepers often put hives near crops of plants such as borage and lavender to pollinate the crop for seed production and also produce a honey crop. Ironically, borage and lavender are grown as sources of seed oils and their oils marketed as health foods because they are high in alpha- and gamma-linoleic acids, substances thought to reduce the risk of cancer as well as having other health benefits.

I found this article about PA honey particularly disturbing because it compellingly described a problem I had no idea existed. Before reading it, I had never heard of pyrrolizidine alkaloids, considered lavender to produce one of the world's most exquisite honeys, and had evaluated and recommended funding for a project on borage pollination thinking it would be good for Canadian prairie beekeepers to diversify their sources of honey production.

The PA issue is part of a larger picture developing in food risk analysis, in which our scientific analytical capabilities have become sensitive enough to detect even a few molecules of almost any substance that plants or animals can produce. Thus, we are becoming aware of risk factors in our foods that a decade ago were not known to exist. The problem of risk has been further compounded by decreasing public tolerance for even the slightest level of contamination by toxins, pesticides, pollutants, or even naturally occurring substances.

Grains, milk, eggs, meat, herbal medicines, and now honey have all been recognized as sources of PA's, and consuming any one of those foods or medicines alone can provide a dose higher than recommended. Having granola and milk plus lavender honey on whole-wheat toast for breakfast every day, followed by a daily borage oil pill, could provide a PA dose ten to fifty times higher than the allowable limits. Thought you were compulsively healthy, feeling self-satisfied with your whole-grain naturopathic herbal lifestyle? Sorry, you've been poisoning yourself with pyrrolizidine alkaloids, and your liver may be about to join those of lifelong lushes in an irreversible state of cirrhosis.

Just as honey analysis is revealing illegal pesticides and antibiotics, it also can reveal trace amounts of potentially harmful natural substances. Honey has been touted for its medicinal qualities, and certainly has a good reputation among consumers as a healthful product. Yet, stories about natural and artificial toxins and contaminants in honey are becoming increasingly common in the media, and we should all be concerned about a potential consumer backlash if the buzz on the street about honey becomes one of concern.

The solution should be proactive; our industry should be looking at establishing a strong research and analytical program to investigate what really can be found in diverse honeys from around the world. Contaminants need to be identified and contaminated honey deleted from the world market, but we also need to determine the levels of naturally occurring substances and any potential risks they may pose for consumers.

For now, I'll keep putting the occasional spoonful of French lavender honey into my tea, but just not every day. As to herbal medicines; hey, luckily I'm not an herbal kind of guy. BC

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Apimondia In Africa

Becoming A Better Beekeeper

Malcolm Sanford

There are three Apimondia standing commissions relating to economics. The Standing Commission on Beekeeping Economy hosted a session on local and international trade in bee products. Mr. Maxime Ramzi Herro of Montreal, Canada discussed new worldwide market niches for honey in Durban. Niche markets are those created for certain populations based on particular needs. There are four main reasons why people consume more sugar than honey he said. These are: 1) the price of sugar is lower than honey, 2) premium honey is not available easily to the general public, 3) honey has a lower and limited production compared to industrial sugar, and 4) actual packaging limits consumption, as most common types (pots and jars) reduce flexibility in service and other food-distribution institutions. It is the latter that Mr. Herro sees has great potential for millions of persons who are interested in consuming natural and organic products. His answer is selling honey in a specially patented disposable bag that he developed. This is already done in some markets. Most have been exposed to some variation of "portion packs" for honey in restaurants http://www.biritefoodservice.com/catalog/food_portion_honey.html. I have seen variations in two other ways based on plastic tubes (sachets) and so-called "honey sticks," which feature honey in plastic and/or biodegradable straws.

A major specialized (niche) market for honey in disposable bags, according to Mr. Herro, relates to diabetes. Of the six billion people now on planet earth, it is estimated that 154 million now are diagnosed with diabetes and by 2025, the number will stand at 300 million. Two kinds of diabetes exist, insulin-dependent (IDDM) and non-insulin-dependent (NDDM). Some 85% of cases are of the latter. The risk factors for NDDM are several, but most important are being over 40 years of age and overweight. The latter is epidemic in the United States and becoming so elsewhere in the world. People with NDDM (sometimes called diabetes type II) must constantly monitor their blood sugar http://www.umassmed.edu/diabeteshandbook/chap04.htm. When it is low (a condition called "hypoglycaemia"), small doses of honey can be far superior to other remedies prescribed by physicians (glucose tablets).

Mr. Herro concludes, "In addition to the diabetes niche, the use of the patented bag filled with premium honey will open doors to 24 other profitable niches around the World."

Opportunities also exist for beeswax based cosmetic products, honey mustard, food condiments, other dressings containing honey and beehive products, medical syrups sweetened with honey and many other liquid, semi-liquid, creamy or powder products.

Continuing the theme of health and honey markets, Mr. Nathan Holleman, of the United States' National Honey Board discussed marketing honey as a functional (health) food. This strategy involves several tactics, including 1) differentiating it from other sweeteners, 2) adding functional properties (value), 3) building the image of honey, 4) revamping the ingredient label and 5) extending marketing efforts into other areas like pharmaceuticals. The best way to approach this, according to Mr. Holleman, is to develop a research program with a scientific advisory committee and credible spokesperson. This has already been done to a great degree in New Zealand through the research of Dr. Peter Molan who has worked on Manuka honey as it relates to health http://honey.bio.waikato.ac.nz/.

Honey for Niche Markets.

Thus, Mr. Holleman concludes: "Health positioning and promotions are an effective tool in marketing a natural food product such as honey. Health research is necessary in order to make verifiable claims which food and health editors and others can use as backing evidence for articles. A panel of scientific experts can add credibility as well as focus and direction to your

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projects, and an industry spokesperson can spearhead your media activities. Positioning research can tell you, in advance, what health messages regarding your product consumers will respond to." For further information on the National Honey Board's activities see its World Wide Web site http://nhb.org/ I reviewed some of the programs of this organization in the June, 1999 issue of my Digital Age column http://bee.airoot.com/beeculture/digital/1999/column10.htm.

International Honey Trade:

Prof. Gu Guoda and colleagues in the Department of Sericulture and Apiculture, College of Animal Science Zhejiang University, Hangzhou, China discussed changes in the international honey trade over the last four decades. They conclude: "World honey imports are mainly concentrated on Europe. North America and Asia are in the next place. In 1999, 57.8% of world honey import volume was from Europe. North America and Asia was 24.7% and 16.3%. Germany is the largest honey importer in Europe, over 45% of Europe total import. Other main importers are Britain, France, Italy, Spain, Belgium, Luxemburg and Switzerland etc. Since 1990, honey imports in Asia indicated a down trend, 81,168 tons in 1990 to 57,144 tons in 1999. While that of North America showed a up trend, from 36,281 tons to 86,438 tons. The reason is that USA increased its imports constantly these years, but Japan decreased its imports."

A conclusion from the paper discussed above is that there is constant change in the honey market place that both producers and marketers must be aware of. The next geographic regions this author understands where there is likely to be an increase in honey production and exportation are India and Vietnam. Dinh Quyet Tam of the Vietnamese Beekeepers Association discussed the situation in his country. There continue to be problems with the quality of honey produced, however, the trend toward exportation is an upward one. He said the quantity and the price of export honey has increased from 50 metric tons (mt) in 1985 to more than 5,000 mt in 1998 and from US$500/mt to US$1,000/mt respectively. Thus he concludes: "The honey exportation plays essential role for beekeeping development in Vietnam as it occupies 75% of honey production, among which honey mainly collected from *A. mellifera* colonies." Although *A. mellifera* honey is mainly exported, the sweet from indigenous honey bee species (*Apis cerana, A. dorsata, A. florea and A. andreniformis*) is sold domestically at much higher prices.

Beekeeping and The Environment

Jerro Maane, MSc. Student, Tropical Agricultural Development. University of Reading, Department of Agricultural and Food Economics, described the concept that beekeeping development also is a way to ensure that pollination takes place. He reported that the Guinea Bissau-Danish Beekeeping Project he is associated with seeks to attract grass-root farmers into modern beekeeping, with a major goal of increasing harvest in tropical bee-pollinated crops (cashew and oil palm).

T. Obster of Zambia Forestry College concluded that there is great potential for beekeeping to alleviate poverty while reducing deforestation. For example, every year a number of charcoal producers abandon this activity and join beekeeping groups in his study area because they see the potential economic benefits. In addition, beekeepers have formed associations, which are actively campaigning against the indiscriminate cutting of trees. W. Chandra discussed beekeeping in Indonesia, as a way of providing opportunities for people near sensitive environments like teak forests. And C. Mlingwa of the Tanzania Wildlife Research Institute reported that beekeeping can be an activity that enhances conservation, alleviates poverty, and advocates encouraging sustainable beekeeping in or around protected areas. BC

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Some Things Don't Change Much

James E Tew

A few months ago, I wrote a basic bee book that is currently on the market. It is nothing more than a no-nonsense how-to book. The problem is that there are literally hundreds of how-to bee books available – both new and old. I sometimes think that we would rather write about bees than work bees.

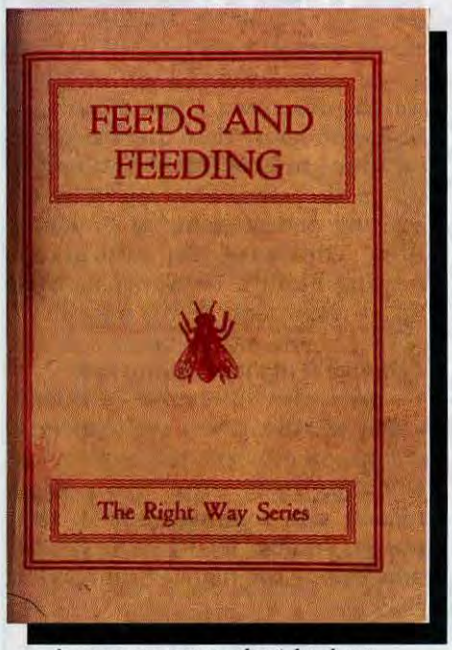
Though I don't actively collect bee books, I have accumulated a respectable number over the years. I can justify the collection as one needed in my line of work. Most are like the one I wrote – do this and do it this way and don't ever do that. You name it – if it's about bees, someone has written about it. Most elicit a yawn, with some passing interest about how much things have changed over the years, but occasionally – just occasionally – an old jewel comes along.

I recently came across just such a small, short jewel – *Feeds and Feeding* by E.E. Root[1] published in 1923. The little book was informative and helpful – though there was obviously no mention of corn syrup or other sweeteners.

Mr. Root began the booklet by saying, "*Whenever possible, feeding should be avoided; for at best it is a messy job, expensive, and in the case of the beginner liable to cause robbing.*" – not exactly a strong admonition to follow chapter and verse of his book. But it got my attention. He continued with instructions not to be greedy and take too much honey. Honey stores go farther and seem to be more beneficial to the colony. Taking too much honey was described by Root as being "*a bad practice and decidedly poor economy.*"

Making the syrup (in 1923)

For stimulating brood production in the Spring, one part sugar to two of water – by bulk – is just about right. For winter feed, two parts sugar to one part water – by bulk – is just about right. Heating the mixture helps. If the mixture is not heated, Root recommended



A non-nonsense, short book on bee feeding.

putting in a teaspoonful of tartaric acid to every 20 pounds of sugar. (This is no longer recommended, and may be harmful. Ed.)

Feeding honey to hives (in 1923)

Use 1/3 honey to 2/3 water being careful to select honey from disease-free hives. A common extractor can be used as a mixing tank. Put in the water first and then slowly add sugar or honey as the extractor is turned. Only fill the extractor about half full of the mixture. (I have never done this so I can't comment.) Even when using the extractor as a mixer, hot water – even boiling hot – is desirable.

Mixing syrup in the field (in 1923)

Take along a washtub, set it on stones, build a fire and make the syrup. Get water from a stream. If possible, perform this task on a cool rainy day to avoid robbing. A portable gas stove is slow and expensive. Fire is cheap. Mr. Root admonished the reader to, "stamp out the fire" before moving on.

Feeders

Even in 1923, Mr. Root said, "*There have been hundreds of feeders invented.*" He referred to the common Boardman feeder, currently called an entrance feeder, as a feeder based on the "atmospheric principle." He proceeded to give instructions on making one – even though you could buy one then and now. He also reported that a discarded "pepper box" could be used as an atmospheric feeder.

He particularly liked the Simplicity Feeder. I have shown one from the 1917 A.I. Root catalog. He said it was cheap, occupied very little room on top of brood frames or could be used directly in front of the hive – but only at night to prevent robbing. This feeder is no longer manufactured.

The Alexander feeder

A variation of the Simplicity feeder was the Alexander feeder. The bottom board was pushed forward the width of the Alexander feeder and it was (somehow) attached underneath the back of the

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[1] Root, E.E. 1923. *Feeds and Feeding.* The A.I. Root Company, Medina, Ohio. 23pp

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hive. Bees could feed from the inside at the back end of the hive. Externally, the feeder protruded a few inches to one side to allow for easy filling. Root didn't like the Alexander feeder. The bees could take all the syrup in just a couple of hours and then – you guessed it – go on robbing binges. Plus, the hive needed to sit exactly level for the feeder to work properly.

Friction-top pails

Since 1923, friction-top pails have not changed, nor the methods of using them, as feeders. Essentially, a can that resembles a one-gallon paint can, has a "few" holes punched in the lid with a frame nail. The can is filled with syrup and inverted over the brood frames. Sometimes they leak. Sometimes the syrup flows too fast or too slow or granulated sugar plugs the holes. Their problems then are our also problems now.

Other feeders

He also discussed the Doolittle Division board feeder which we now simply call a division board feeder. His was made of wood while ours are now made from plastic.

He discussed the Miller Feeder which is now called a top feeder. The Miller feeder was a bit complex, but works exactly the same as our modern plastic top feeders. At every step, Root chided the reader to work on cool days or at night to avoid robbing. Apparently, at some point, he had had a very bad experience with robbing bees.

Feeding without a feeder to prevent starvation (in 1923)

Okay, a hypothetical beekeeper of about 80 years ago really screwed up and his (or her) colony was approaching starvation. The advice? Put a brick under the front of the hive so it tilts back. Pour either thick sugar syrup or honey (from a clean source) over the brood frames. Yes, it will leak from the cracks between the deeps and the bottom board, but the writer said that the bees, which are starving otherwise, will have immediate access to food stores. As Mr. Root said in his opening comments, "feeding can be messy."

A Simplicity Feeder from the 1917 A.I. Root catalog.

Feeding to stimulate brood rearing

I feel that the advice on stimulative feeding contained in the booklet is still good today. When feeding to stimulate brood rearing, use smaller amounts of thinner syrup. The beekeeper is not feeding to build up stores, but rather to build up bees. Mr. Root recommended the remarkably small amount of about one pint per day. He suggested that the reader use a feeder from which the syrup dispensing rate could be controlled – like the Boardman feeder or a friction top pail. Essentially plug all the holes but one allowing for a very slow drip. Root's opinion was that it was much better to feed a small amount very slowly than to feed a small amount very quickly. If given at an uncontrolled rate, a colony would suck down a pint of syrup in hardly an hour. Then the bees would be more interested in robbing or would become cross caused by the starting and stopping of the syrup flow. The syrup for stimulative feeding should be approximately 33.3% sugar and 66.6% water.

Feeding at night or during rain

In warm climates or during warm weather, Root recommended only feeding during the night hours or during rainy times. The primary reason was robbing control. Only put on enough feed for the bees to take during the night or rain period.

Open air feeding

Root wrote, "....*it may appear to be the height of folly to recommend the same thing that has been previously condemned...*" but there are times when open feeding is desirable.

Essentially what the beekeeper is doing when open-feeding thin syrup is providing an artificial nectar flow. If given a day or so to find the source, forager bees will actively collect the artificial nectar rather than rob each other. If you need to remove honey, raise queens or engage in any task that would otherwise incite robbing, open-feed to give the foraging bees a diversion. Root also pointed out that such a diversionary feeding can successfully keep foragers away from the neighbors when home canning is underway or "to keep bees away from candy stands at the fairgrounds" Essentially, anytime you want to "call the bees off," open-feed. When starting to open feed, begin with sweet syrup but as soon as the bees find it, cut the ratio to one part sugar to nine parts water – essentially lightly sweet water. Use any kind of large container with appropriate floats to prevent bees from drowning.

Disadvantages of open feeding

Open feeding is generally a poor way (or expensive depending on how you look at the situation) to distribute foodstuffs to colonies. The wear and tear is much greater on the foragers. Also, the rich get richer at the expense of the weaker hives. Spreading foulbrood was also listed as a reason to be cautious about open feeding.

Other feeding topics

Root also discussed other common topics such as feeding for Winter stores, but these recommendations were essentially the same as ours today. But he went into some detail on making hard candy for Winter feed. It is a torturous procedure that requires detailed temperature control. He said, "Whoever makes the candy should clearly understand that if the mixture is scorched, even in the slightest, it will make unfit food for the Spring or Winter feeding."

Finishing where he started

Essentially, Mr. Root ended his booklet at the point at which he started – if possible – don't feed. By now you know all the reasons why. Rather said he, within each supering procedure, give the bees an extra shallow super in the Spring

for them to fill and then hold that super as a reserve food source. Rather than feed thick or thin syrup or feed at night or during the rain or open-feeding, just put on your special super that is filled with high quality food, in the right place at the right time. He even said to leave the super on the colony at all times, but I must admit that I have several questions about that procedure. Without some precautions, the beekeeper would get brood in the super or some colonies would use it early and produce too much brood. I don't know. It is a good idea to have reserve food, but I suspect it would be better if the beekeeper controlled the timing of making it available.

It ended

Without fanfare, the booklet ended. It was a good review, it was quick to read, it was packed with common sense and it was practical – plus the publication had the old-book-musty smell. Pleasant reading. I don't know where you can get a copy. BC

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MEADS And Their Lactones

A Cautionary Note For Meadmakers

Dan McFeeley

The operative question for the meadmaker is, how can this help me make better mead?

Among the many factors winemakers take into account in making a well balanced and flavorful wine, acidity ranks among the highest. A wine with insufficient acidity is said to lack zip and zing, causing medium bodied or sweet wines to become cloyish. Acid, measured as TA (total acidity) and pH (active acidity), is carefully assessed and care given to the type of acid(s) present in the wine when considering acid additives. Tartaric acid is the primary acid found in wine grapes and imparts a strong and sour taste. Malic acid is more frequently associated with apples and ciders. Citric acid is found in citric products, giving a sour and lemony flavor to a fruit or country wine. Gluconic acid is the primary acid found in honey and, of course, in mead but stands apart from the other organic acids due to its unique properties. Although these properties are well known to honey analysts and the honey industry, oddly enough the literature on meadmaking is silent on the subject. This is all the more striking given the highly complex reactions of gluconic acid in the chemical makeup and flavor profile of mead.

The easiest route to outlining acidic properties in honey is to briefly look at how honey bees make honey. The process by which honey bees convert flower nectar to honey is truly amazing and only understood within recent decades, after much painstaking research.

A simplified outline of the chemical reactions are as follows:

Glucose Oxidase

$C_6H_{12}O_6 + O_2 \longrightarrow C_6H_{10}O_6 + H_2O_2$

Glucose + Oxygen → Gluconolactone + Hydrogen Peroxide

Hydrolizes to

$C_6H_{10}O_6 + H_2O \longrightarrow C_6H_{12}O_7$

Gluconolactone + water → Gluconic acid

Invertase and glucose oxidase, enzymes secreted from the hypopharyngeal glands of the bee, work on the sucrose sugars in flower nectar, "inverting" the sugar to glucose and fructose, and then oxidizing glucose to hydrogen peroxide and gluconolactone, the lactone product of gluconic acid. In the next step of honey production, gluconolactone partially hydrolyses to gluconic acid, leaving both the acid and the remaining gluconolactone co-existing in a pH dependent relationship that helps to buffer against changes in acid content. If the pH of the honey is stable, gluconic acid and gluconolactone remain unchanged. If the acid is neutralized, raising the pH, more of the gluconolactone in the honey hydrolyses into gluconic acid, thus lowering the pH again. The rate of the lactone reaction is also dependent on the pH of the honey. The higher the pH, the faster the reaction takes place.

The lactone reaction causes persistent problems in honey analysis by interfering with analytic procedures using any form of acid base titration method. Long recognized as the "fading endpoint problem," honey researchers were aware that it was difficult to measure or analyze certain components of honey up through the 1940's but it wasn't until a 1958 publication by John W White Jr. that the lactones in honey were identified as the source of the unstable pH in acid base titrations. White ran a series of experiments demonstrating the presence of the lactone reaction and devised a special method for measuring total acid content that could be used in honey analysis. This article was a critical step in identifying the complex acid properties in honey.

Home winemakers are usually interested in the more practical aspects of oenology and chemical analysis. The operative question for the meadmaker is, how can this help me make better mead? Measurements of total acidity and pH are the important parameters for acidity in home winemaking, giving the winemaker a good idea of the needed counterbalance to residual sugar as well as ensuring quality of flavor profile. Meadmaking calls for use of these acid measurements, however, the lactone reaction in honey has not been examined or even considered in honey fermentations.

The lactone reaction in mead was identified by this writer in a series of two experiments, closely following the experiments first conducted by John W. White Jr. in 1958. A "show mead," i.e., a mead made with yeast, honey, water and no additives, was made up for the

Continued on Next Page

first series of experiments. The need for a show mead was to minimize factors that could potentially skew the experimental results, such as various acids and salts from yeast nutrients. The second series was conducted with a strawberry melomel (i.e., a mead made with fruit), made with nutrient additives and yeast. The purpose of the second series was to show that the lactone reaction, once identified in the show mead, continues to persist even in the presence of other chemical factors. Both the show mead and the strawberry melomel used different honeys, orange blossom and wildflower honeys respectively. As White showed in his 1962 analysis of 490 honeys, the ratio of lactone to acid varies according to the type of honey. For this reason, it should be expected that the lactone reaction will vary somewhat according to the type of honey used in the mead.

The experimental series were quite simple and can be duplicated in any home with ease. All that is required is a standard winemaking acid titration kit, an electronic pH meter, mead of course, and a watch with a second hand. A solution of 0.1 N sodium hydroxide was used to raise the pH of the meads to the desired levels, then monitored with the pH meter. Three different starting pH levels were used for each mead and the results recorded. It is important to add a measured amount of sodium hydroxide all at once, stirring it into the mead quickly in order to reach the desired pH level. The lactone reaction occurs very rapidly and may not be observed if the sodium hydroxide is added slowly.

For the show mead, the pH was raised for each of the three series to 7.8, 8.8, and over 9.0 The strawberry melomel was raised to pH 5.2, 7.0 and 8.8. The results were as follows:

FIRST TRIAL: SHOW MEAD
Starting pH 3.1

pH	Time	pH	Time	pH	Time
7.8	0 sec.	8.8	0 sec.	9.0(+)	0 sec.
7.1	15 sec	7.8	15 sec.	6.4	30 sec.
7.0	30 sec.	6.6	30 sec.	6.3	60 sec.
6.9	60 sec.	6.3	45 sec.	6.2	2 minutes
6.9	30 minutes	6.1	60 sec.	6.2	30 minutes
		5.9	2 minutes		
		5.8	30 minutes		

SECOND TRIAL: STRAWBERRY MELOMEL
Starting pH 3.3

pH	Time	pH	Time	pH	Time
5.2	0 sec.	7.0	0 sec.	8.8	0 sec.
4.8	10 sec.	5.1	5 sec.	7.8	5 sec.
4.7	60 sec.	5.1	30 sec.	7.2	15 sec.
4.7	30 minutes	5.1	60 sec.	6.9	30 sec.
		5.1	30 minutes	6.8	60 sec.
				6.8	30 minutes

The trial results clearly show that for each time the pH of the mead was brought close to neutral or above, the pH dropped again to acid levels, duplicating White's 1958 observations of the action of honey lactone. In this instance, it is the lactone present in the mead changing to gluconic acid that accounts for the drop in pH following the addition of sodium hydroxide. The rate of the lactone reaction at high pH levels made observation difficult, so difficult, in fact, that the attempt to raise the show mead to pH 9.0 was impossible to accurately record until the pH dropped to 6.4.

The observed results of the lactone reaction in honey are simple and dramatic, in spite of the complexity of the chemical processes that are involved. Essentially what happens is that whenever the acids in a honey solution are chemically neutralized, the lactone content reacts and the solution once again becomes acidic. The reaction is well known in honey and requires altered procedures in order to perform standard chemical analytical techniques such as measuring total acidity (TA) or free amino nitrogen (FAN). The persistence of the lactone reaction in a finished mead calls for similar considerations.

As can be seen in the trial series charts, the lactone reaction in mead interferes with the titration method used in standard winemaking acid kits, skewing the results and making them unreliable for measuring total acidity (TA) in mead. This is of serious practical consequence for meadmakers. Many home meadmakers will add acid to a finished mead in order to improve the flavor profile, measuring total acidity (TA) and calculating the amount of acid to add to the mead based on the results of the TA measurement. Given the unreliability of measuring TA in mead because of the lactone reaction, and especially with the wide variations in lactone content among varietal honeys, this can be a very uncertain undertaking. This is probably part of the reason why the advice given in meadmaking circles for adding acid has shifted from adding set amounts, to adding acid only to taste, if at all. The palate was proving to be more reliable than TA measurements, even though the cause of the difficulties was unknown.

Honey has long been considered to be poorly buffered against pH changes, however, this question needs to be reconsidered in light of the lactone reaction. It seems that many of the observations regarding the poor buffering of honey fermentations were made prior to White's 1958 publication, with the assumption maintained for long afterwards in meadmaking circles. The late Roger Morse's Masters thesis, titled "The Fermentation of Diluted Honey" and submitted to Cornell University in 1953 is an example of this. On page 45 he noted "Honey is a weakly buffered sugar solution which is unable to maintain a fixed pH within a few tenths of a pH unit when a small amount of acid or base is added to it." This statement was made five years prior to White's 1958 article and consequently does not take

into account the lactone reaction's effects on the pH of a honey solution. Honey may or may not be poorly buffered, but this cannot be accurately affirmed without using analytical procedures that take the lactone reaction into account, and without keeping in mind the wide variations in composition among varietal honeys, including lactone content.

One of the most far reaching consequences of recognizing the lactone reaction in mead is the realization of how unique mead is in comparison with other fermented beverages. Honey as a biochemical food product stands apart from others due to a number of unusual properties. The more we learn about how bees make honey, the more we understand how amazingly fine tuned the process is. Honey is far more than an exotic sweetener to be used from time to time in place of sugar, and its use in meadmaking likewise makes mead a beverage as unique as honey. BC

RESOURCES

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A Little Help Keeps Labs

Jeremy Alford

Three national honey bee labs have gone from slash burns in the federal spending plan to restored and "protected" budget items in the past six months, due mainly to a grassroots campaign, research progress and a little congressional help.

The research units are operated by the U.S. Department of Agriculture and were part of a $15 million base fund reduction for Agricultural Research Services (ARS).

In February of this year, President George W. Bush called for the closure of three of the four USDA honey bee labs, including the sites in Baton Rouge, LA, Beltsville, MD, and Tucson, AZ – which would have left the Weslaco, TX, site as the last lab standing.

All roads may not lead to the Weslaco Bee Lab in Texas.

The administration said it was an effort to cut spending and streamline bee research, based on the findings of a task force established by the most recent Farm Bill committee.

For nearly five months, the three units operated under the assumption that the doors were closing effective Oct. 1 – internationally recognized research was scheduled to be disbanded, some existing positions and funding were being transported to Texas and the facilities themselves were facing final curtain calls.

But if you visit the three research labs around the nation today, you'll notice a buzz remains in the wind and honey still flows from combs of gold.

However, some of the sources interviewed for this article were still unaware of the fact that the funding nightmare was coming to an end at press time, at least according to three congressional leaders who represent the districts that house the bee labs – U.S. Reps. Richard Baker, R-LA, Steny H. Hoyer, D-MD and Jim Kolbe, R-AZ.

The three lawmakers drafted a letter to House Appropriations Chairman Henry Bonilla in June asking him to ax the eliminations and restore funding to previous levels. They described the research at the labs as "the first line of defense" against mites, pests and diseases that pose serious threats to the health of honey bees and the plants they pollinate.

"The work of the ARS laboratories ensures a robust and healthy honey bee population, which is necessary for sustained honey production and for effective pollination. These laboratories... benefit those who grow, market, and consume U.S. food and fiber," they wrote.

According to the letter, the budget cut would have ultimately slashed total funding for the units from $5.7 million to $2.5 million and changed the number of existing positions from 21 to 9.

Baker said gaining support for the refunding was a fairly easy task that garnered attention from both sides of the aisle.

"First of all, because of how strongly I believe in the importance of this research, I saw it as a crucial opportunity to work closely with a bipartisan pair of legislators who are just as committed to this issue, and who also, helpfully, happen to be senior members of the Appropriations Committee," Baker said.

The letter's other signers, Hoyer and Kolbe, are senior members of the Appropriations Committee and brought substantial clout to the table in their battle to save the labs.

When coupled with an ongoing grassroots letter writing campaign conducted by local beekeepers in the labs' districts, and from across the nation and the increase in information concerning research that was finally reaching the hands of congressional leaders, the budget item was easily restored in early July, Baker's office said.

Under the ARS section of the current Appropriations bill, the following committee provision has been added:

"Bee research – The committee recognizes the importance of honey bee research carried out by ARS at Beltsville, MD; Baton Rouge, LA; Weslaco, TX and Tucson, AZ and directs that these programs and resources be continued at the FY (fiscal year) 2002 level."

Baker and congressional leaders expect the House to pass the budget with the item intact and predicts smooth sailing from here on out.

"I expect that we will gain support for our efforts when the Senate takes up their spending bill after us, and funding will be protected for next year. But what I will be vigilant about is making sure we protect this important research," Baker said.

For the most part, the three restored labs can return to their research and leave funding woes for another day. They can now return to their gene research, stock analysis or colony comparisons, that

From Slash and Burn to Restored and Protected

is, depending on their geographic location.

Each of these labs has their own mission and specialty. Additionally, each lab has folks other than Uncle Sam who depend on them – the local beekeepers, overjoyed at the labs' continued service, who ask for advice on how to increase productivity, or state universities who conduct their grant research with USDA cooperation, or even beekeeping clubs and organizations who rely on research directors from all levels for expert opinions.

Here's a brief snapshot at the three labs who returned from the brink of funding doom:

BUZZ IN THE BAYOU

Mark Williams, vice-president of Capital Area Beekeepers, was one of many activists in South Louisiana who were writing letters to Congress in an effort to save the three ARS bee labs, especially the one in his hometown of Baton Rouge.

"There were a lot of us signing petitions and writing letters. We had to... the lab has done a lot for Baton Rouge and for the nation. They were instrumental in creating new treatment plans for the bees that goes beyond just increasing honey production," he said.

When Williams has a problem with his hive or questions about pests and what to do, he turns to the Honey Bee Breeding, Genetics and Physiology Research Unit in Baton Rouge. He says their work with Africanized and Russian bees as well as mite resistance alone has been a lifesaver.

According to Dr. Tom Rinderer, research director at the Baton Rouge laboratory, the Louisiana unit addresses problems caused by Africanized bees, Varroa mites and tracheal mites by working on honey bee stocks and studying bee management.

"The current mite problem in the nation, separate from our research, is very, very severe. It's a disaster in the process of happening," Rinderer said.

It is in this area that the lab has made its biggest strides.

Over the past five years, honey bee researchers in Baton Rouge have been conducting genetic research on the Russian honey bee, which they discovered has a resistance to a variety of mites and pests that can ruin an entire bee stock and set back the pollination of certain crops, most importantly a resistance to one of the beekeeper's worst enemies – the *Varroa* mite.

Rinderer and his team found a way to transport the "resistance gene" from the Russian bee to the bees commonly used in America.

"We're working at a level of resistance we didn't have four years ago. It's really amazing," Rinderer said.

The intensive research has resulted in the revitalization of a dwindling bee population. Additionally, the introduction of this resistance in the commonly used three-banded Italian bee will keep private and commercial beekeepers alike from having to use harmful pesticides, Rinderer says.

Research programs at the Honey Bee Breeding, Genetics and Physiology Laboratory essentially seek to minimize problems that challenge honey bee productivity and maximize bee stocks for beekeepers. Breeding and genetic studies focus on long-term solutions for problems caused by parasites such as *Varroa* and tracheal mites. According to information provided by the lab, their principal aim is to devise solutions based on genetic resistance of bees to these mites.

"A research component involving DNA studies represents a long-term investment to problem solving with tremendous potential," their mission statement says.

In addition to garnering national attention for increasing honey bee productivity and stabilizing bee stocks through genetic research, the lab has been known to answer a few questions from the community.

"We've handled it all," Rinderer said. "How to get more bees in the garden, how to get bees out of a wall... answering whether or not African bees are coming to Louisiana. We work more on the commercial side of operations, but we do try and help out the local beekeepers."

MARYLAND'S FINEST

The Beltsville Agricultural Research Center in Maryland has been recognized for its research on bee diseases and pests as well for providing a bee disease diagnostic service for more than 100 years. The lab first opened its doors in the 1890s in Chevy Chase before moving to Beltsville in 1939.

The diagnostic service receives more than 2,000 samples annually from across the United States. This service provides beekeepers and bee inspectors with authoritative identification of bee diseases and pests.

The Beltsville laboratory is the only federal honey bee research unit located in a climate representative of the majority of beekeeping areas in the U.S., making certain aspects of research somewhat "universal," says Dr. Anita M. Collins, a research geneticist at the lab.

"This is very effective... if you're working on a mite treatment that is sensitive to temperature, what may work in the sub-tropics won't work for the guys up north. Our location is mid-Atlantic. And it helps with management," she said.

Collins has been involved with the preservation of honey bee germplasm, which was reportedly one of the programs high on the chopping block. Through avian and porcine germplasm research that takes place at the Beltsville lab, great strides have been made in this area.

In a brief interview with Dr. Mark F. Feldlaufer, research Entomologist and research leader, he said the lab is also spearheading the USDA effort in seeking FDA approval of two antibiotics to control American foulbrood disease of honey bees and referred *Bee Culture* to the lab's website for more information.

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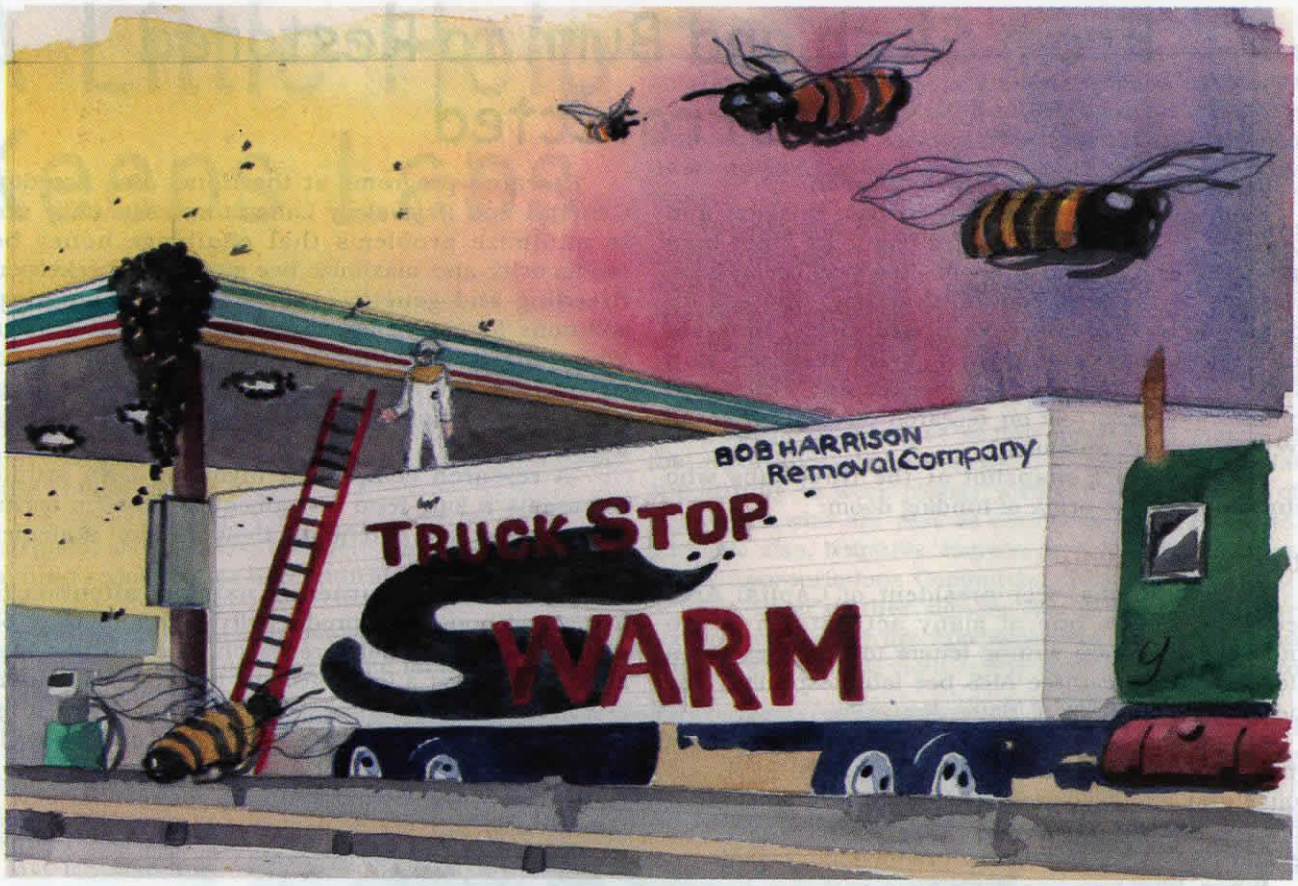

I just returned from catching the Truck Stop Swarm. I thought information about the Truck Stop Swarm might come in handy to those beekeepers which have yet to receive a call about dealing with a Truck Stop Swarm.

How To Recognize The Truck Stop Swarm

1. The swarm usually appears (or is first noticed) at daybreak.
2. The swarm usually is located on the outside lane in the truck fueling area.
3. The swarm is almost always on the roof over the fuel lanes close to the lights.
4. The swarm is usually a loose bunch of bees and *not a typical swarm in behavior*, and there have been a couple stinging incidents before you arrive, but not always. There have been at least a couple buzzings.

Ways To Get Out Of Going After The Truck Stop Swarm

1. Say you can't come until next week. The bees are usually gone after a week.
2. Say you are afraid of heights.
3. Charge a ridiculous fee.
4. Tell the truck stop employee who calls, that you do not carry insurance and the truck stop will have to be responsible for your injuries if you get hurt.

Almost always they will tell you they will not be responsible if you get hurt, but *please* catch the swarm. Most pest control outfits do not do bee calls. I carry insurance on my bee activities so the truck stop people always call me. The employees have been told never to use an independent contractor, which does not carry insurance, which is generally a rule they follow closely. My brother is a lawyer and says if a beekeeper was removing a swarm at the truck stop and got hurt in the process, the truck stop would still be liable. In other words if you hire a contractor to do work on your house or business or give permission for work to be done and those people do not carry insurance, you as the home owner or business owner can be liable if a person gets injured on your property. Laws vary from state to state.

Saying you are too busy does not set well with those truck stop employees, which consider The Truck Stop Swarm a big crisis. I would recommend another excuse.

I feel it is my obligation as a beekeeper to remove swarms and a couple of truck stops are in my area. I am a familiar face at both truck stops.

I always go if the bees are creating a problem!

I have created a few truck stop swarms with my bees over the years, so will explain how Truck Stop Swarms come to be. Trucks loaded with beehives normally fuel at night. They usually use the outside lane on the truck fueling side. Many use Meyer *RoadRunner* orange netting so the fact that the truck is carrying beehives is not easily discovered. Those employees familiar with a Truck Stop Swarm will often run out and wave you away from the truck stop if they figure you are loaded with beehives.

While fueling, hundreds, maybe thousands of bees are able to escape from places around the netting and fly up to the canopy lights. These are mostly older guard bees, which have exited the hive entrance under the

netting, then left the truck through holes or other places around the load. They are usually disoriented and tend to be in a nasty mood.

My Method Of Handling The Truck Stop Swarm

1. Close the lanes on both sides of the lane with The Truck Stop Swarm.
2. Get a trucker to back his rig under the canopy with the swarm. I have always been able to find a trucker who will do this. Ask the driver to stay in his truck and let him, or her know you will signal when done. Working off the top of a truck is better, in my opinion, than working off the top of a 20-foot ladder. I've been lucky and have always been able to reach a Truck Stop Swarm from the top of a trailer, but it might not work at every truck stop as some canopies may be higher than those I work with.
3. Borrow a ladder from the truck stop to get on the top or the trailer.
4. The best method is to use a bee vacuum because you can quickly get most of the bees, especially if you have an extension wand.
5. If you use a regular swarm box, when you brush the bees into the container you will quickly notice the bees are aggressive and will sting. They also fly out as quickly as you brush them in. Keep jarring the swarm box on the roof of the truck trailer to keep the bees in the bottom of the swarm box.
6. You will not get all the bees without a bee vacuum, but you will reduce the swarm to a non-threatening size. The longer you try to get every bee the more irate the remaining bees will become. Those bees can, and usually will, cause stinging incidents around the truck stop. If you are not using a bee vac be content to leave a few bees. Many times you can return later at night or early the next day to get the rest of the bees. The truck stop is happy that most bees are gone and care little about the small amount of bees left behind.
7. An alternative method is to kill the bees with a soapy water spray as per the method described in a video available from A.I. Root about handling honey bee emergencies. The water needs to be very soapy (one cup liquid detergent in one gallon water). I have used both starting fluid (available from automotive stores) and flying insect spray on the hundred or so bees left after the main group of bees have been removed.
   The starting fluid works better than most bug sprays in my opinion and is provided freely by the truck stop. The bees need to be wet from the starting fluid for knock down and kill power. I try to take most of the bees and not spray the few bees left. I do not want the general public to get the idea that killing is the way to handle ALL SWARMS.
8. Be sure to suit up. I warned my neighbor and the truck driver to stay back a safe distance, but they stood right beneath where the bees were falling. Have you ever noticed that when a man is doing a project many other men are attracted. Not to help, but give advice. Men cannot simply watch other men doing something without giving advice. Catching a swarm is no different. Lift the hood on your car and right away the men on the block start to come out of their houses to give advice and supervise the project.

To sum things up The Truck Stop Swarm is not a swam at all, but simply a bunch of disoriented bees.

What To Do With The Truck Stop Swarm

1. Drive to a remote area and shake the bees and drive away. (Method I use as I do not want to bring new problems into my hives, and without a queen the bees will simply live a few days and die off).
2. You can shake bees out in the area of your hives, but I never do. I hive all swarms I catch in my area from all sources *except* the Truck Stop Swarm. These are from trucks from distant areas and could, and probably do carry more problems than I already have.

I have never seen a Truck Stop Swarm with a queen for obvious swarms.

Truck Stop Swarms are an ideal opportunity for some good, local, P.R. You may make the evening news, but probably not, but you will definitely make life easier for those who work at and use the truck stop. Don't forget the outrageous fee. It may make the truck stop people charge more for full Bee Trucks in the night. BC

Bob Harrison gathers truck stop swarms all around his home in Odessa, MO. He is a commercial beekeeper.

Wintering Success

The Environment, The Bees, and You . ..

Allen Dick

Last month we discussed why wintering is a critical part of successful beekeeping. This month we continue to look at the economics and start to examine factors we can control, or at least manage, to improve wintering success.

As in many things, success in wintering honey bees comes from knowledge, good planning, careful execution of those plans, and careful scheduling. Luck certainly plays a part in it, but to a large extent, beekeepers make their own luck.

Successful wintering requires time and money, and some hard work now, but if that effort is not made, unsuccessful wintering will require time, money and hard work next Spring – and obviously good wintering pays much better. You can pay now, or you can pay more later.

What are the key ingredients to success in wintering honey bees? There are three main influences at work: the bees themselves, the environment, and the beekeeper. There is an interaction between these three factors, and unless they all add up to contribute to your wintering success, that success is less than certain.

Know your Environment

Probably the very best advice anyone can give to any beekeeper who wants to Winter bees successfully is this: get to know the neighbor beekeepers. Go to bee meetings and make friends. That way you can learn what the unique local challenges are, and also will know sooner if a new beekeeping problem turns up in your district. Find out who always has good wintering (and remember that it is not necessarily the one who claims to do so) and try to get invited over to see their bees.

Most beekeepers are happy to show off their bees to an appreciative audience, so if you are polite and considerate, you will be invited back. If you can, make sure you visit the most successful neighbors in their bee yards at least four times during the year, at times like splitting, extracting, feeding, etc., if possible. Then go home and put what you learned to use.

When you visit, don't just ask questions, watch carefully and look around. Think like a detective. Good beekeepers often don't always exactly know, consciously, what they are doing; they just do it, and do it right. They often cannot explain what they are doing, so you have to watch. Sometimes their success is due to good luck, sometimes it is due to good management, and sometimes it is just due to good instinct at work. That part doesn't matter, the results are what count, and careful observation can help you learn their 'secrets' and duplicate their success. Offering your free labor to help during a visit can go a long way in learning, and in getting invited back.

People often talk about grandma's cookie recipe and how, no matter how carefully they have followed her written recipes, they find that their own cookies never taste quite as good as hers. People often suspect that grandma was cagey and left something out on purpose, just to keep her secret. Maybe so, in some cases, but often as not, it never occurred to grandma that someone following the recipe wouldn't know how she greases the pan or what type of flour she used. That part was never mentioned.

The same applies in beekeeping; no matter how carefully a beekeeper tells you how he or she does something, there is no substitute for being there and watching. Little details can be vitally important

There is, however, one very serious pitfall to observing a number of good beekeepers and trying to emulate them. Many bee-ginners visit experienced beekeepers and observe carefully, but then go home and decide that they will take the best of all the systems they have seen, and devise their own. This seems like a good idea, but almost always results in disaster – sooner or later – because there are hidden factors that they don't consider.

Successful systems for wintering vary widely and may seem very different at first glance, but they all have one thing in common: they must satisfy the basic requirements for bees to be comfortable in Winter, and not be vulnerable to unexpected events.

Any proven system is a *system*, not just a collection of ideas. Each and every part of a good system meshes with the other parts under varying conditions to achieve success year after year, cold Winter or warm Winter, long Winter or short Winter. Success for just one year does not prove a thing. Choose one system that has worked well in your district over many years, and then copy it as closely as you can.

Know Your bees

Good wintering begins with good bees. We'll talk another time about health and other factors, but one thing stands out above the rest: If your bees are not of a type that is suited to wintering, all your other efforts will be in vain. If you happen to have good wintering bees, you may succeed beautifully even if you make a few mistakes.

Are your current bees from a stock known to Winter well in your area? Some bee stock simply will not Winter well in regions that have a long, cold Winter. Other stock will Winter in such regions with a minimum of

fuss and come out looking good. I have seen strains of otherwise very good bees that consistently suffered 90% Winter losses while another stock in exactly the same conditions – showed 90% success. No amount of planning, feeding, insulating, medicating – or praying – will make a non-wintering stock survive a severe Winter.

Be sure to select stock with a proven track record for your area, and if you raise your own queens be certain to select from hives that have wintered well and which also look good in the Spring. Of course you will want to select for some other good qualities too. I had some bees years ago that wintered beautifully, but never seemed to make much honey for me. There are lots of good wintering bees available that make honey, resist disease, and are reasonably gentle too. They can be found by looking through ads in bee magazines, consulting locally, and through checking with state bee extension services. Mostly, ask other beekeepers in your locale.

If you decide to requeen to change to better wintering stock, start early and remember that it takes many weeks for a new queen's offspring to completely replace the bees from the previous queen. Requeening won't change a hive from poor wintering bees to good wintering bees overnight. Even after the new strain of bees has replaced the original stock in the hive, they may need time to reorganize the stores. Bees that Winter well often organize the brood chamber differently from the less Winter-hardy types.

Assuming the bees are of a good wintering type the other big consideration is the condition of the queen. She should be reasonably young and healthy, in her first or second season, depending on your management. Normally we don't need to see her to know how she is doing. With some knowledge of the hive's history, a look at the bees and the brood, and a comparison to other hives nearby, a conclusion can be reached as to whether she is likely to make it through and be able to do a good job in the Spring.

If in doubt, Fall requeening may be a good idea or, if the hive seems poor and weak compared to others,

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Wrapping hives is one way to get through a severe Winter. Whether individual or grouped, there are rules to follow we'll discover these next time.

Recovering from Winter loss: Splitting the survivors

This table illustrates how much increase must be made from survivor hives to get back to fall hive numbers for increasing percentages of Winter loss. At 50% loss, 100% of the survivors must be split in two. Will they be strong enough to make a decent crop and survive the Winter? Much depends on the locale and how good the season turns out to be.

Winter Loss	0%	10%	20%	30%	40%	50%	60%	70%	80%
Splits per Survivor	0	0.11	0.25	0.43	0.67	1.0	1.5	2.33	4.0

The difficulties and costs associated with wintering loss are very mild when the losses are light, but increase rapidly in severity. As the losses mount, they quickly reach a point where there is no way to recover in one year, and new money and/or bees must be brought in to save the enterprise.

From the table, note that at 10% loss, only 11% of the surviving hives need be split, or that only 11% of the resources of the surviving hives need be shared to make up the loss. That is easy, and the cost is around zero.

At 20% hive loss, 25% of the remaining resources – brood and bees – must be shared to get back to the hive count from the previous Fall. That is usually practicable, but with a 30% loss, 43% of the remaining resources must be shared. At that point, the burden on the parent hives can become damaging.

Beyond 30% loss the situation quickly becomes hopeless, since fewer and fewer hives must donate more and more. In many regions, replacement bees must be purchased in such a scenario – or fewer hives operated – if any honey crop is to be expected.

Beyond that point of no return, splitting surviving hives to return to the hive numbers from the previous year becomes increasingly difficult and risky. If the splits made are too small, not only will the crop be drastically reduced or lost completely, but there is also a real danger that the splits themselves could be too small to care for themselves and require feeding all Summer. Even with that sacrifice, extra effort, and expense, the resulting hives might not grow large enough to Winter well.

It's a vicious circle. At some level of Winter loss, recovery becomes impossible without bringing in outside resources. Anticipating and preventing heavy colony losses is usually much cheaper than trying to recover afterwards

Ukranian Bee Stamps

Figure 3. *A 2000 stamp postal cancellation and cover honored Petro Prokopovych, the "Father of Modern Beekeeping," on the 225th anniversary of his birth.*

Ingert Kuzych

Ukrainians have appreciated their hardworking insect friends from the very earliest of times. Originally, among prehistoric people, the idea was solely to gather honey and wild hives were simply raided in haphazard fashion. It wasn't long, however, before the settlers of the Ukrainian forest-steppe devised a way to collect honey in a more systematic and dependable fashion. Many of the greatest advances in beekeeping (apiculture) were subsequently made in the territory of Ukraine. It is not surprising, then, that Ukraine has already released four stamp issues in its first decade of independence that depict bees or beekeeping.

The first innovation in domesticating bees was to keep them in hollow logs or gums (*borti*). These would be placed high in trees to mimic natural tree trunks. This method, called *bortnytstvo*, was practiced until the middle of the 18th century. In a few forested areas – Volyn, northern Chernihiv, or the northern Kyiv regions – it persisted to the beginning of the 20th century.

Figure1. *Last year's well-designed souvenir sheet was able to incorporate many facets of Ukrainian beekeeping through the ages.*

Last year the Ukrainian stamp production firm "Marka Ukrainy" produced a splendid souvenir sheet that illustrated much of the history of beekeeping in Ukraine. The trees on the right and left selvedge of the souvenir sheet display examples of *borti*. Also shown are some of the tools used to collect honey by honey

Figure 2. *Ukraine's first beekeeping stamp (1994) depicted beegatherers from the middle Dnipro region of Ukraine as they appeared in centuries past.*

gatherers (*bortnyky*) and various methods used to protect the *borti* from marauding bears. Platforms that prevented an animal from climbing upward or spiked devices (fixed around the foot of a tree or freely swinging around the bark) proved to be clever and effective deterrents.

Bortnytstvo was replaced by *pasichnytstvo*, which involved placing hives on or by tree trunks in forest clearings or orchards. This method is first mentioned in documents from the 14th century. During the medieval princely period, honey and wax were very important items for domestic consumption, for trade abroad, and for use as tribute. The beekeeping industry was deemed important enough to be protected by law. In the 15th and 16th centuries famous wax warehouses (*voskovi komory*) were set up in Lviv, Lutsk, Volodymyr, Berestia, and Bilsk. In the 16th and 17th centuries beekeeping developed rapidly and spread further east into the steppes proper.

Figure 2 is the first Ukrainian stamp to show apiculture. Released in 1994 as part of the Ethnographic Scenes stamp set, it carried the letter 'E,' which was the regular letter rate to countries of the former Soviet Union. Shown on the stamp is a *pasichnytstvo* scene from centuries past: beekeepers tending to two different types of primitive beehives (*vulyky*), some covered by a flat wooden block, others with a peaked, thatched roof.

A number of additional types of beehives were developed in Ukraine over the centuries. Three types of historic hives are illustrated along the bottom of the souvenir sheet (Figure 1). On the left is a woven type constructed of the some of the same materials used to make baskets. In the center is a stacked round hive, resembling a small, limbless tree. Its sections could be removed to extract wax and honey.

The square hive on the right is also a stacked type, but it contains square frames that can be easily removed one at a time. The introduction of removable, wooden frames upon which bees make their honeycomb is the key invention that launched modern beekeeping.

The frame hive was invented in 1814 by Petro (Peter) Prokopovich, a landowner from the Chernihiv area, who also organized industrial beekeeping. He founded a beekeeping school in 1826 in the village of Palchyky, near Baturyn, where he taught progressive apiculture.

Prokopovich is shown holding his frame invention both on the central illustration and on the stamp of the first day cover from 2000 that honored his contributions to apiculture (Figure 3). The simple, practical, wooden frame design has not changed significantly to the present day.

The creature responsible for honey and wax production in Ukraine in centuries past and to the present day is the central European gray bee (*Apis mellifera*). A variety of this species – the Ukrainian bee (*bdzhola*; *Apis mellifera* var. *ucrainica*) – produces copious honey and overwinters well. It is shown up close on yet another philatelic issue honoring beekeeping, this one from 1999 (Figure 4). Both this single stamp and the upper left stamp on the souvenir sheet present the most common bee caste, that of the female worker bee (*robitnytsia*). Positioned on a flower, the bee is shown with pollen (*pylok*) on its hind legs. The upper right souvenir sheet stamp shows another worker bee, this time on hexagonal combs within the hive.

Figure 4. *The common honey bee (bdzhola) appeared on this stamp from 1999.*

The lower left and lower right souvenir sheet stamps show the other two bee caste types: a queen bee (*matka*) and a drone (*trut*), respectively. The queen is the true mother of the bee colony.

Readers interested in obtaining any of the items described should contact: Lemberg Stamps and Covers, P.O. Box 4054, Edmonton, Alberta T6E 4S8 Canada.

Ingert Kuzych grew up and kept bees in Michigan. Ingert received a doctorate in agronomy from MI State University and currently works for the government in the DC area.

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VOL. vs WT.

Quarts, Pints & Gallons Need Attention, Too.

Ann Harman

It's strange – we buy milk by the pint, quart or gallon – a *volume* measurement. We also buy soft drinks, fruit juices and cooking oil by *volume*. Anything *liquid*, including gasoline. The measurement is stated on containers in "Fl Oz" standing for fluid ounces. We buy rice, cereal, potato chips and candy bars – *all solids* – by *weight*. Containers will state "Oz" or "Lb" for ounces and pounds. Those ounces, for weight, are classified as avoirdupois ounces but nobody ever uses the avoirdupois bit – too much to spell. Well, nobody ever said our system of measurements was easy – we are just used to it.

To add to the wackiness, we sell honey, usually a liquid, by the *pound*. Weight measurement is certainly the only way to sell comb honey, obviously (kind of) a solid. There is no law that says we must sell honey by the pound. If we wish we can put honey into pint or quart or gallon containers and state that fluid measurement on the label. Or we can put weight measurement on the label but this is actually a bit awkward. Getting confused? Hold on – there's more. Five-gallon buckets of honey are referred to as 60s – a weight. But drums are usually called 55-gallon drums – a volume.

Beekeepers do have a choice of containers for honey. The queenline jar was designed to hold one pound of honey. The jar was designed to resemble a skep, sort of, and to be a thin, flat jar that permitted light to shine through giving the honey a gemlike quality. What sorts of containers do you use for your honey? If you put your honey in 60s or drums, go read something else in the magazine.

It is really interesting to see what containers are successful under different circumstances. Here are the results of a survey taken: out of about 100 replies, 90% were small producer/packers. Of these, 45% used pints, 58% used quarts and 66% used gallons. Not exclusively perhaps, but as a part of their marketing program. So it seems that pints, quarts and gallons are popular containers for honey. Pints, quarts and gallons are recognized by consumers as holding a given *liquid* quantity. However beekeepers will put weight on labels, particularly for the pints and quarts. Is that because we are used to selling honey by the pound if it is in queenline containers? I really don't know.

A pint jar and a quart jar do not hold a very sensible weight of honey. A quart jar does not hold 3 pounds unless it is filled so full as to be messy when opened. You can determine this for yourself with the aid of a good accurate scale. If you do not own such a scale, take a jar of honey to your local post office and ask the postmaster to weigh your empty pint and quart in exchange for the jar of honey. You would be surprised what a jar of honey will achieve. Then go home and fill the jar correctly with honey – over the bead and about 3/8 to 1/2 inch down from the rim. Weigh this. Subtract the empty jar weight and you will know what a pint and a quart jar will hold. It's easier to use volume. Sell it by the pint, the quart or the gallon, not the weight each of these contain.

Since so many people are using pint, quart and gallon containers, what can be done to make them more appealing? Unfortunately many of the canning jars have a design on the surface, frequently covering all sides. Sticking a label on a bumpy surface just does not work. Yet, the label is valuable and important.

If you have been buying canning jars with designs and writing all around, see if you can find some with at least one side smooth so that you can use a suitable label. The label will feature the word "honey" and will have your name or apiary name and some contact information. A rectangular label or right-sized oval would be the most appropriate shape for a flat or blank area on a canning jar.

Suppose all the canning jars in pints and quarts that you wish to use do have a design all over? How about a hang tag? You can design your own. It can be simple with only the word "honey" on one side along with the volume – 16 fl oz (473 ml) (for the pint jar), or 32 fl oz (946 ml) (for the quart jar). On the back can be your contact information – name, address, telephone number if you wish.

You can make a fancy hang tag. That is one with several "pages" for recipes, hints for care of honey, other uses of honey or something about the floral sources. Information about bees and your apiary would also be appropriate for information on a hang tag.

So far I have not mentioned the lid for these pints and quarts. Canning lids come in two pieces – the ring and the flat part that seals. This type of lid is totally unsuitable for pints and quarts. It is a nuisance to use and rather pointless. The honey is not sealed in, as one would for canned tomatoes, for example. The flat sealing part cannot be reused for canning since the fused gasket would not seal correctly.

Several bee equipment suppliers sell very nice lids that fit the regular-mouth canning jar. You can find

regular-mouth lids in both white and in gold. White lids are available for the wide-mouth jar from D&G in Vermont.

The flat top of these lids is a perfect place for a label. A simple label with "honey," the volume and contact information can be designed to fit. Or, if you have chosen a jar label or a hang tag, the top label can be a useful place to put the type of honey, such as "mountain meadow wildflower," or some other description that fits your farm or locale. Labels on the tops of jars attract attention when the jars are well below eye-level, such as at a farmers market or craft fair. Make good use of that space on the lid!

You can dress up canning jars with rounds of attractive cloth tied over the lid. However, look around at your competition from jams and jellies. These frequently have cloth lid covers. You do not want your honey overlooked as being more jam in a market or a shop. If your honey jar will be the only container with a cloth cap, then use it if appropriate. Otherwise, use the lid for an interesting label.

Now we must consider larger containers – gallons and the yard rent jugs. These come in both translucent and clear plastic. The color of honey is best shown in the clear jugs. But many who buy in a large quantity know the value of honey in their lives and do not need to be impressed with a beautiful appearance of the honey.

These gallons and yard rent jugs do need labels – large labels. Do not attempt to use labels for one pound queenline jars and stick them on a gallon jug. The label just looks dinky. And dinky is not a good message to convey. If you have been making hang tags, you can make some for the jugs but make the tags of an appropriate size. Since the tags will be larger than those for pints and quarts, you can include more recipes and cooking hints.

By the way, change your recipes from time to time. There are so many honey recipes that you will never run out of different ones. You can have recipes for the seasons, for holidays, or for some particular type of food, such as salad dressings or meat sauces. Don't forget recipes for foods that children can make.

However, jugs are jugs and as such are not particularly attractive when put on display, say at a farmers market or perhaps at your home. Do you know what people do with the honey in these quantities? For table use it must be poured into something suitable. Here is where our faithful honey squeeze bear can be of service.

Gallons and other jugs and large containers are frequently stored out of sight on a shelf or in a pantry. The bear will not only convey honey to the table for daily use but also carry the message of good honey to others who normally would not see the jug.

An empty bear can be fastened to the top or the handle of the jugs. Rethink your first inclination to tie a string or ribbon around the neck of the bear and hang it on the jug, don't do that. It isn't nice to strangle a bear. Instead, use a little creativity. A ribbon can be used to make a harness for the bear – then it can hang from the handle. Some styles of bears might have a ribbon around the waist. You will have to experiment with the particular style of bear you choose. An easy way is to put the string in the bear, and fasten the cap. The other end goes around the handle or neck of the jar. Or, tie it around the bear's cap it it's not full of honey.

We are fortunate in being able to obtain so many sizes and styles of bears. Just look through the equipment supply catalogs! Bears come in sizes from 8 ounce to 32 ounces (that's ounces of weight). Your advertising can say "You get a free bear with every gallon." Before you decide you cannot afford to give away a free bear, think again. The price of that bear will be hidden in the price you are charging for the gallon. (Did you really think the trinket in the CrackerJack box was free?)

You can actually fill a bear with honey – the same honey that is in the jug if you wish. Or this bear can be a sample bear of a different color and flavor of honey that you have produced. Since it will be a heavier bear than an empty one, be sure to tie it firmly to the handle or top. You can explain that the bear is ready to use as table honey and when empty can be refilled. What about the customers who tell you they already have a bear or they use a honey pot. Then suggest they give the bear as a gift to someone who needs to appreciate good honey.

Now we have the dilemma of the bear without identification going to be a gift. The honey-filled bear you attach to a jug can have the cardboard ring – the hat brim – that fits under the cap. Your contact information and weight can be put on the ring. Even better, the bear can have a label, even if it is an empty bear. Now the bear can advertise your good honey. This is especially important for yard rent jugs. The recipient of yard rent may not be a beekeeper but the honey will be visible to others. Let those people know where the honey can be purchased.

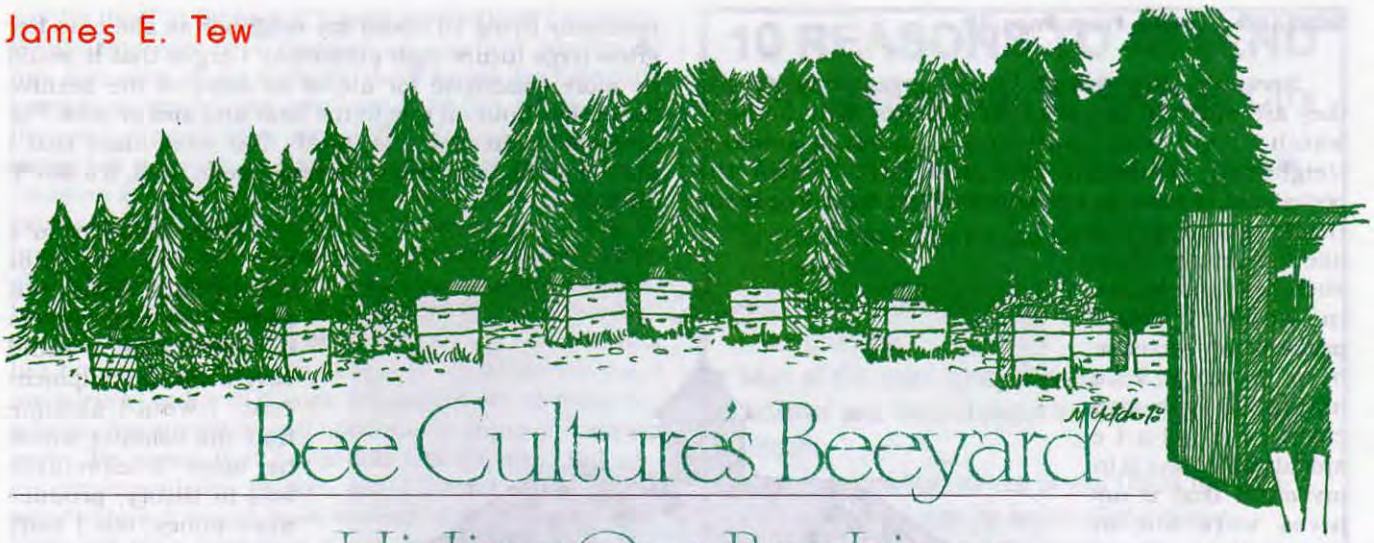
Keep your eyes open for sales of items such as ribbon and artificial flowers. Sometimes you can find real bargains in these, especially if they are seasonal items. Yes, you may have to store them for a year until a particular holiday comes around again. Just don't forget where you put them.

What can you do with ribbon or flowers? Use them to decorate jugs at a craft fair or farmers market. You are using the jugs to dress up your space and attract attention to the jugs themselves. A flower tied onto the jug handle with a nice bow will attract attention. True, someone may not buy the gallon of honey but may well buy another smaller size. At least a customer was attracted to your display.

Those popular pints, quarts, gallons and yard rent jugs should not be overshadowed by the queenline and hex jars. Those popular containers should be made as attractive as possible. And remember, a squeeze bear is ready to help. BC

Ann Harman is a sideline beekeeper and international marketing consultant.

James E. Tew



Bee Culture's Beeyard

Hiding Our Beehives

Nary a hive

At this very minute, I am speeding along the 80/90 Turnpike in Northern Indiana going back to Ohio after attending the inaugural *Heartland Apicultural Society* (HAS) meeting in Goshen, Indiana. It was a good first meeting. My wife is driving while I watch mile after mile of lush forest and farmland pass by – at about 65 miles per hour. Just as you must have done, on this and previous trips, I have literally watched thousands of beehiveless miles pass by. Seeing a beehive – even a single hive – is always reason for comment. I ask myself, "If beekeeping is so important to U.S. agriculture, why are our bee yards very nearly invisible to the public?" I don't have a clear answer, but I have often thought that we are missing a public-relations moment by being so obscure.

An octagonal bee house in Seville, Ohio circa 1870.[2]

It's not just us

It's not just U.S. beekeepers who don't show off their colonies. When I visit Ontario and Quebec on frequent occasions, I don't see their hives either. It wasn't common to see hives from the road in Mexico when I traveled there. On more extreme trips, such as one to China I took several years ago, beehives were practically invisible. When our tour group did finally see bee yards near the Great Wall, we practically jumped from the moving bus. A later trip to Australia provided my "visible beeyard" high water mark. We frequently saw hives from the bus and we pointed out each and every yard to the driver – a behavior that was amusing for the first few hundred hives, but one that, I suspect, later became tiresome to him. But, alas, for road travelers in the U.S., seeing a neat, organized beeyard is disappointingly rare. I don't know. Maybe it doesn't matter. I suspect it's just the beekeeper in me. Seeing beeyards along the highway encourages me and supports my bee interest. But for all I know, the public would not even notice a visible beeyard.

When I consider my own feelings, I realize that I prefer my yards somewhat secluded. If I'm going to get stung up; if I can't keep up with grass cutting in the yard; and if I can't keep my hives nicely painted, then I will hide the yard. In fact, only one of my 10 yards is visible to the public. Oh well, whatever. I will continue to look for hives and I will continue to evaluate mile after mile of what appears to be unexploited nectar and pollen plants – all the while wondering why someone doesn't put colonies there.

Meanwhile, back at home

Now that I am safely home and having gotten the "*why are there no hives along the road thing*" off my chest, I now roam to a topic that continues in my current vein of hive-hiding – bee houses (or bee sheds or shacks or whatever you call them.) *At this point, Editor Kim is sighing mightily and saying, "Not the bee house thing again..."*

A cool, hive house

As a young kid, I can remember being disconcerted that I did not sweat as much as my father when we worked outside. He appeared manly when dripping sweat while I was skinny, tan, and red-faced and bone dry. I honestly recall wetting myself down so I would appear to be sweating; therefore, leaving the appearance of performing manly work. No problem now. I sweat to the point of being water-wasteful. I have it in mind that one of the things a bee shed would do is keep me out of the heat and in the shade[1].

Continued on Next Page

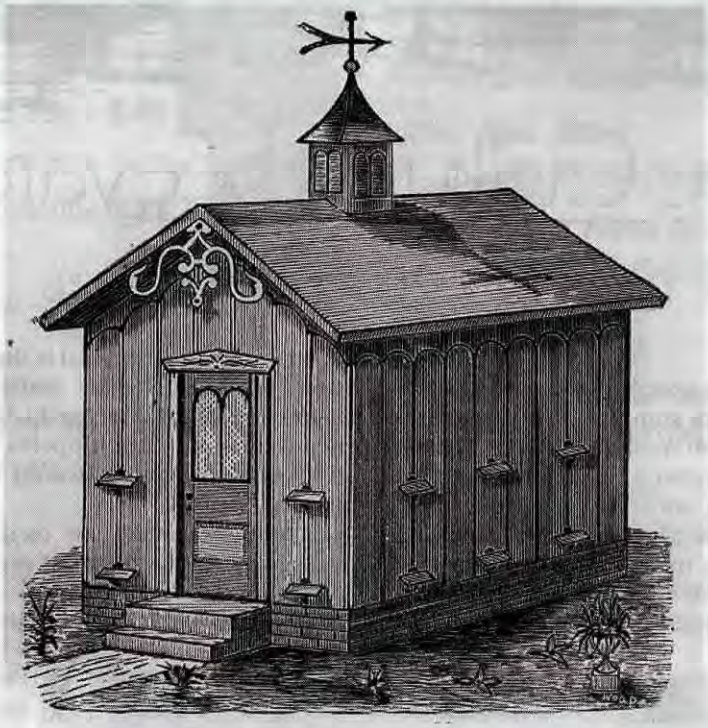
[1] Tew, James E. 1997. *The Overheated Beekeeper.* http://bee.airoot.com/beeculture/months/97jul/97jul3.htm

[2]Photo from: Root, A.I. 1882, *ABC of Bee Culture.* Medina, Ohio. Page 20

BEEYARD ... Cont. From Page 39

Secondly, even though I have agreeable neighbors, they are watchful as I work my colonies. Who wouldn't watch – veil, white suit and a smoking smoker. Neighborly comments are common. I accept the occasional remark as a bee-way of life, but I frequently think that I would like the privacy of an enclosed bee house in which I could perform my secretive beehive manipulations and contemplate apiculture. I have it in my mind that if my hives were out of sight, they would also be out of my neighbor's mind.

Third on my list is that such a house may actually offer some protection to the hive both in the Summer and in the Winter. In theory, by being cooler in the Summer and warmer in the Winter, my hives would be happier and healthier. Others, including me, have written in the past about some of the attributes of a bee house, but their time seems to have passed here in the U.S.



A house apiary for 20 hives circa 1870.[3]

Documented concerns

Common reasons for bee houses not being in vogue are cost and space. For what it would cost to build a small bee house, I could buy several (even many) more hives. Then there is the concern about a commitment to a permanent yard. Moving beehives is one thing while moving a bee house is something else all together.

A complaint that I would not have anticipated is mice infestations. Some of the very old writings have figuratively cursed mice within the bee house. With all the food reserves, dead bees and protection from the elements, it would appear that mice had found the perfect year-round home.

But I argue

So there you have it a bee house costs too much, space for colony growth is limited, benefits to the colony are questionable and mice love such places. Yet, I cannot get the concept from my mind. I argue that I could control my colonies better within a house. Robbing would decrease, and defensive bees would be somewhat contained within the structure rather than randomly flying all about my neighbor as she cuts her grass (ergo future legal problems). I argue that it would be more conducive for me to do some of the beehive tasks that I put off due to the heat and sun or cold. For instance, right now it is 90+°F You must know that I am not going to do bee work now due to, well, it's 90+°F outside.

Since colonies in a bee house do not require outer covers, but rather only inner covers or screen tops, I would save a bit of equipment cost. I would assume that the colonies would be more comfortable and in theory, produce more honey, but I can't say that conclusively. Even if they did produce more honey, could it be a result of my performance of timelier beehive management procedures (i.e. requeening, adding supers, and reversing brood chambers)?

Finally, would a bee house be a hive number restrictor? If I only have room for eight colonies would that restriction control my hive number growth? Written another way, I only intended to have about six colonies in the *Bee Culture* yard, but I have closer to thirteen. I only planned to have two colonies in my backyard but I now have seven. Like most beekeepers, I can always justify a few more hives – hives that I really don't need. If I had space restrictions, would I do a better job maintaining the restricted number?

My plan

This is what I am considering. A small utility building that will house about eight colonies – four colonies per side. At the start, I only want two – four colonies in the house. The building would (ideally) be electrified and hives would sit on racks along the wall about 24 inches from the floor. I would cut slits in the building wall and provide landing boards on the outside of the building. I would want double doors on each end of the shack to provide a venturi effect to help with ventilation. If it were high enough, I would actually consider a ceiling fan, but doubt that will happen. I would hope that there is a small amount of space for surplus equipment storage or even room to extract, but I have never tried to extract so near bee hives – plus I would not have ready access to water. Though I enjoy woodworking and construction projects, I anticipate buying a pre-constructed building.

Planning is free, but implementation of this project could cost me several thousand dollars. Will it ever

[3]Photo from: Root, A.I. 1882. *ABC of Bee Culture.* Medina, Ohio. Page 19

pay for itself in increased honey production? I doubt it. Would this ever be a commercial venture? Absolutely not. And what about zoning? I don't know. Am I actually going to do this? Right now I am at 50/50. Obviously, if this was a great idea, more of you would already be using bee houses. As I wrote earlier, bee houses were common in years passed so we have used them more extensively in the past. But even so, some of you do presently keep hives within or under sheds. From those of you who currently keep bees in such buildings, what has been your experience? Where are my plans wrong?

I have no intentions of putting all my colonies in a bee house, but here at my home in an urban setting, I am curious to know if such a building would make me a better bee neighbor and allow me to enjoy beekeeping more. Be aware that I can still change my mind and not implement this project, but if I don't, I will always wonder how it would have worked. If the bees hate the shed and it's a total bust, I can always convert the bee house to a gardening shed – right? BC

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

BEE LABS ... Cont. From Pg. 29

The bacterium that causes this disease is beginning to show resistance to the only currently approved antibiotic and is devastating bee colonies across the nation.

For Maryland beekeepers like David Smith of Queen Anne, this particular research has gone a long way to answering some tough questions.

"I'm struggling with foulbrood right now. I don't know if there's any colony in Maryland that doesn't have problems. It's very difficult – we suffer queen losses and mite problems. If it wasn't for the lab and their services, this would be even more difficult for us," he said.

Smith added that the relationship between the Beltsville lab and the beekeeping community is exemplary.

"They are essential in keeping a majority of our beekeepers abreast on recent research, diseases and pests," he said.

The Beltsville lab can also be credited for:

- The Africanized bee identification service that determines whether honey bees are Africanized. The Beltsville Bee Lab receives samples from APHIS, state regulatory agencies, and from state Experiment Stations.
- New controls for parasitic mites, including an ARS-patented gel formulation of formic acid. The commercial product is environmentally-friendly and offers economic control.
- The development of a "screened bottom board" – a hive modification that reduces the number of parasitic mites without the use of chemicals. The screened bottom board and various modifications based on the Beltsville design, are being offered by many bee supply companies. The screen works by allowing loose, dislodged mites to fall through the screen to the ground below, removing them from the hive, and not allowing them the opportunity to reinfest other bees.
- Controls for small hive beetles that attack stored honey. These controls dramatically decrease or eliminate beetle damage in honey houses. The strategy that relies on reducing the humidity to below 50% (an environment that kills beetle eggs) was a result of basic research on beetle biology.

DESERT DRONES

The Carl Hayden Bee Research Center in Tucson, Arizona works to improve crop pollination and honey bee colony productivity through quantitative ecological studies of honey bee behavior, physiology, pests and diseases and feral honey bee bionomics.

Scientists at the Tucson lab are studying Africanized bees and researching ways to halt their invasion, which poses a constant threat to both gardeners and beekeepers.

The lab garnered international attention last year with the development of VarroaPop (download for free at gears.tucson.ars.ag.gov/soft/index.html) – short for "*Varroa* populations" – which is a multimedia software program that provides beekeepers with a scientific-based estimate of how quickly a mite population located inside a beehive might expand.

Using the software, beekeepers can simulate hives based on facts such as the size and strength of the bee colony and the current size of the mite population. Weather conditions, the time of year and the queen's productivity are also taken into account.

The software will then tell the user how to treat the hive and when to use miticide.

"Timing of when to use a miticide is very important. Simulations can show how important a week's delay may make. "By running these simulations we can discover when is the best time to introduce a miticide," Dr. Gloria DeGrandi-Hoffman, research director at the Tucson lab, told *Wired Magazine* in March 2001.

Officials at Carl Hayden Bee Research Center were unable to take part in this article, but officials at Arizona State University were more than forthcoming on their relationship with the local bee lab.

Jennifer Fewell, an AZ State University biologist, has conducted research at the lab in connection with a grant she received to explore the differences in Africanized and European worker bees.

"They were extremely important in the African bee research. We collaborated on that research and did most of it on-site," she said.

Fewell says the university conducted studies on common host colonies to discover several differences between the two species – African bees collect more pollen, they have higher metabolic rates when foraging and a decade's worth of other data.

"I couldn't have done any of it without them. I did everything, the observations, right there using USDA stocks. We're happy to have them here," Fewell said.

The Carl Hayden Bee Research Center is located on about five acres deeded to the USDA by the University of Arizona and is only four miles from its main campus in Tucson. As Fewell pointed out, the geographic location allows for cooperative endeavors between the lab and the university.

According to their mission statement, their research spans three major problem areas:

- Improvement of honey bee pollination of fruit and seed crops and ecologically important plant species.
- Assessing the impact of mites and their microbes associated in honey bee colonies.
- New techniques for the detection and control of feral Africanized honey bees.

At press time, the Senate had yet to decide on the USDA ARS proposed budget for honey bee research, and the lab consolidations. Indications are that, for at least another year, funding will be approved.

If this occurs, the beekeeping industry will need to monitor the funding and closing proposals again to make certain they are not threatened. BC

Jeremy Alford is a freelance journalist located in Baton Rouge, LA who covers state politics for the NY Times Company and has written for a number of local, statewide and national publications on a wide variety of topics.

WINTERING ... Cont. From Pg. 33

combining it with another hive may be a good decision, although old timers say that combining two poor hives just results in one poor hive. In Fall, such hives can be used to boost a good nuc that is promising, but a little short on bees.

Know Yourself

No matter where we look, some beekeepers seem to have consistently good luck wintering and others never seem to break even. The winners span the spectrum from hobbyist to professional and may choose to Winter in single brood chambers or in three standards.

Some choose to wrap their bees and restrict entrances, but others – just as successful – may forego wrapping and choose to augment the natural ventilation by propping up lids or adding auger holes. Many different approaches work, depending on the locale.

Why are some people consistently successful and others consistently fighting failure? Wintering preparations must all be done on a tight schedule set by nature. Highly imaginative people often have problems that less creative sorts never experience. Usually success is simply a matter of timing and of thoroughness. Those who are good listeners, can follow instructions and can meet a schedule succeed. Those who have trouble understanding or getting out and doing things on time will fail.

In my experience, the beekeepers who suffer the fewest losses are those who understand and respect their bees, think practically, and emphasize 'what is' over 'what might be', and 'what works', over 'what should work' They study, consult, observe, and stick to proven methods for everything they do. If they experiment – and every beekeeper does experiment – they make limited tests and do not apply drastic changes in equipment or techniques to their whole outfit until the new idea is proven to work well, *and for a while.*

Normal Winter Loss

Knowing what our losses are and comparing them to others around us can help us improve our wintering. Most beekeepers calculate their Winter loss by counting up the dead hives and figuring a percentage. Some loss – usually fluctuating under 10 or 20%, depending on the region and the year – is considered normal and acceptable, particularly if the *surviving* hives are strong and healthy.

Zero loss would be ideal, but in any apiary there are always a few hives that are not as good as the rest for a variety of reasons. Sometimes this is obvious when it is time to prepare them for Winter and sometimes developing problems are not yet apparent. If the queen is about to fail there are often no warning signs.

Each and every queen bee has a limited productive life that can vary from several weeks to several years. For any individual bee, we can never predict for certain how long that life will be. Although using young queens provides some assurance that most will last the Winter and perform well into Spring, we know statistically that over any time span, a small percentage of all queens, regardless of age, will always fail. We also know that when a queen fails, the hive she serves goes into decline.

Winter confinement in the north can last up to six months and during that time, some queens will fail, and no remedial action by the bees or the beekeeper is normally possible. Fortunately the natural rate of queen failure is normally quite low in *healthy* hives. Moreover, queens that quit laying, become drone layers, or go missing near the *end* of Winter can usually be replaced without loss of the hive.

These natural and unavoidable losses are acceptable, especially if the survivors are strong and healthy, but when Winter losses reach somewhere around 30%, depending on the region, the year, the condition of surviving colonies and other factors, there is a *'point of no return'*

The Point of No Return

Most of us aren't fully aware that the relationship between percentage loss and the corresponding rate of splitting required to replace the lost hives is not linear, nor do we realise how steep the expense curve becomes once we pass 10% winter loss – until we have to face the problem and find that we are in deep trouble. If we know in advance how serious these Winter losses can be, we can make extra effort to avoid them, or plan ahead for replacements.

Whether made up by splitting, or by buying package bees, Winter loss can be a real and crippling expense. On the other hand, where wintering is successful, surplus bees and hives can be sold or used for increase, hives can be at full strength for all flows, and most of the hard work is lifting full supers, extracting, filling drums, and rushing empties back to the yards. Bees are healthy and feed their young well. Well-fed bees Winter well. The beekeeper is content, and the cycle continues. BC

Allen Dick is a part time commmercial beekeeper from Swalwell, Alberta, Canada. He is a frequent contributor to these pages.

?DO YOU KNOW?

Other Bugs

Clarence Collison
Mississippi State University

Insects are the dominant group of animals on the earth today. Over one million species are currently known to man. While beekeepers are primarily interested in the western honey bee, *Apis mellifera*, it is also important for beekeepers to be familiar with other closely related bee species, as well as numerous other arthropods that are associated with and impact the beekeeping industry.

Take a few minutes and answer the following questions to determine how well you understand this important topic.

The first nine questions are true and 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. ___ Fume boards are used for the treatment of tracheal mite infested colonies.
2. ___ Both common moth fumigants, PDB and naphthalene are recommended for the control of wax moth.
3. ___ Yellow jackets construct a nest out of a papery material that is secreted by glands located in the abdomen.
4. ___ Small hive beetles have now been found in all states except Alaska and Hawaii.
5. ___ *Varroa* mites are beginning to develop resistance against coumaphos (Checkmite+ Strips®).
6. ___ Blue orchard bees forage at lower temperatures and for longer periods of time than honey bees.
7. ___ Wax moth larvae feed on, digest and assimilate some of the wax of a brood comb.
8. ___ Bumble bees have annual colonies with queens and workers overwintering in the temperate climates.
9. ___ Leafcutter bees carry their pollen loads back to the nest on their hind legs.

(Multiple Choice Questions, 1 point each)

10. ___ The small hive beetle was first found in North America in 1996 in:
    A. Florida
    B. Georgia
    C. South Carolina
    D. North Carolina
    E. Alabama

11. ___ The bee louse (*Braula coeca*) is actually a:
    A. Fly
    B. Beetle
    C. Tick
    D. Parasitic Fly
    E. Mite

There are several species of non-honey bees that are valuable in the pollination of several commercial crops. Please match the following bees with the appropriate scientific name.

A. Blue Orchard Bee B. Alfalfa Leaf-cutter Bee
C. Japanese Hornfaced Bee
D. Alkali Bee E. Southeastern Blueberry Bee

12. ___ *Habropoda laboriosa*
13. ___ *Megachile rotundata*
14. ___ *Osmia lignaria*
15. ___ *Osmia cornifrons*
16. ___ *Nomia melanderi*

17. Various bumble bee and carpenter bee species are similar in size and appearance. Please indicate how you can differentiate between the two bees. (2 points)
18. Compare the brood diets of mud-daubers and bumble bees. (2 points)
19. Even though wax moths are considered to be a serious beekeeping pest, they are considered to be beneficial in other ways. Please indicate two ways in which they are beneficial to man or the environment. (2 points)
20. Stingless honey bees are common in the tropical regions of Central and South America. Please explain how these honey bees defend their colonies. (2 points)
21. Please identify the insect responsible for tunnels of mud found in the corner of the hive body where the wood has been destroyed. (1 point)

ANSWERS ON NEXT PAGE

?Do You Know? Answers

1. **False** Fume boards plus a chemical repellent i.e. Bee Go® (butyric anhydride) or benzaldehyde are used to drive bees from honey supers as they are being removed from colonies for honey extraction. Fume boards are not used to treat colonies with tracheal mites.

2. **False** Moth balls and crystals made from naphthalene should not be used to control wax moth. This chemical is readily absorbed by beeswax and is detrimental to the colony. Paradichlorobenzene (PDB) is the only approved wax moth fumigant.

3. **False** Yellow jackets construct a nest out of a papery material that is produced from wood and vegetable fibers that are collected and chewed by the workers.

4. **False** Reported small hive beetles infestations have been found in at least 21 different states. The small hive beetle was discovered in Florida during May 1998. By December 1999 the pest had made its way to 13 states, including Florida, Georgia, Iowa, Maine, Massachusetts, Michigan, Minnesota, New Jersey, North Carolina, Ohio, Pennsylvania, South Carolina and Wisconsin. By the end of 2000 the pest had been found in 15 states, including Tennessee and Vermont. During 2001 it was found in Delaware, Illinois, Louisiana, Missouri, Alabama and Mississippi.

5. **True** Currently *Varroa* mite resistance to the CheckMite+ Bee Strips® (coumaphos) has been documented in both Florida and New Jersey and undoubtedly will be found in other areas, as well.

6. **True** Blue orchard bees are "early spring" bees. They are well adapted for flying under poor weather conditions, and forage and pollinate under overcast skies and at temperatures as low as 54° F., when other bees, including honey bees are barely active. On days with good weather conditions blue orchard bees start foraging earlier in the morning and end later in the afternoon in comparison to honey bees.

7. **True** Wax moth larvae receive most of their nourishment from impurities in the wax, and in obtaining these impurities they ingest the wax itself.

8. **False** In the temperate climates, bumble bees have annual colonies. A bumble bee colony begins each Spring as a solitary overwintering queen. In the Spring she emerges from her overwintering site, starts visiting flowers and looking for a nest site for her future colony. She is responsible for rearing the first generation of worker brood by herself. Males and new queens are produced mid to late Summer. New queens mate and seek an overwintering site. The workers, males, and old queen eventually die.

9. **False** The leafcutting bees differ from most other bees in that the females of the pollen-collecting species have the pollen brushes on the ventral side of the abdomen rather than on the hind legs.

10. C) South Carolina

11. A) Fly

12. E) Southeastern Blueberry Bee

13. B) Alfalfa Leaf-cutter Bee

14. A) Blue Orchard Bee

15. C) Japanese Hornfaced Bee

16. D) Alkali Bee

17. The abdomen of the carpenter bee is without hair, shiny and black, whereas, the abdomen of the bumble bee is covered with yellow, black and sometimes orange hair. Carpenter bees also lack a pollen basket on the hind leg.

18. Each female mud dauber constructs her own clump of mud cells and provisions them with paralyzed spiders.
Bumble bees feed their young with honey and pollen.

19. Destroys dead diseased colonies so combs do not serve as disease reservoirs.
Used for fish bait
Raised for pet food
Used for research and teaching entomology

20. Since the stingless honey bees cannot sting, they defend their colonies by swarming vigorously over an intruder and biting. Some species also secrete a fluid which is irritating to the skin.

21. Termites

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

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

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

GLEANINGS

SEPTEMBER, 2002 • ALL THE NEWS THAT FITS

National Honey Nominations Committee
VENEMAN NAMES MEMBERS

Secretary of Agriculture Ann M. Veneman has appointed 15 members to the National Honey Nominations Committee, which nominates individuals for appointment to the Honey Board.

Newly appointed members are: Richard Leber of Mobile, Ala.; Rollin Hannan Jr. of Southbury, Conn.; Lincoln Sennett of Albion, Maine; Leonard Joy of Reno, Nev.; Alden Marshall of Hudson, N.H.; Judith A. Doan of Hamlin, N.Y.; Donna M. Robitaille of Warwick, R.I.; and Daniel B. Weaver of Navasota, Texas.

Reappointed members are: Robert L. Miller of Watsonville, Calif.; Paul E. Limbach of Silto, Colo.; Timothy P. May of Woodstock, Ill.; I. Barton Smith Jr. of Crownsville, Md.; Darrell J. Rufer of Waverly, Minn.; Stephen E. Stoddard of Delta, Utah; and Deborah A. Copenhaver of Lost River, W.Va.

All members will serve terms beginning July 1, 2002 and ending June 30, 2005.

The National Honey Board administers an industry-funded national research, promotion and consumer information program to increase honey consumption in the United States and abroad. USDA's Agricultural Marketing Service monitors the operation of the board. More information is at: www ams usda gov/fv/ rphoney.html.

Weslaco Bee Lab
NEW SCIENTIST

A new Category III scientist position at the USDA Weslaco Bee Laboratory was recently filled by Bob Cox. Bob began work here July 15 and will be doing research on the control of bee diseases and parasites. He will be working cooperatively with other scientists at thelab as well as working onhis own research projects.

Prior to coming to south Texas Bob was the Iowa State Apiarist for almost 13 years. Bob previously worked at the Weslaco lab as an Entomologist from 1985-1989 under the direction of Dr. Bill Wilson. He can be reached at the bee laboratory by phoning 956.969.5005, fax 956.969.5033 or email: bcox@weslaco.ars.usda.gov.

BLOW FLIES REPLACE BEES

Mango growers in Australia's Northern Territory are using the common blowfly to pollinate mango flowers.

They said that unlike bees, the blowflies are active in the early morning when the flowers are opening.

With mango flowering in full swing across the tropical area of the Northern Territory, many growers were using fresh meat to encourage blowflies to breed under the trees.

"The more blowies the better," said Sam Blaikie of the Commonwealth Scientific and Industrial Research Organization's mango flowering project in Darwin,. "If you've got a heap of flowers on your trees and your orchard's silent, you need to be worried. Get some insects in there. Blowflies are a good insect to have."

Alan Harman

ASSESSMENTS STILL REQUIRED FOR BEEF PRODUCERS & IMPORTERS

July 10, 2002, the U.S. Court of Appeals for the 8th Circuit granted a request for stay which allows the beef promotion program to continue without interruption while the appeal is pending.

A June 21 decision by a District Court in South Dakota ruled that the Beef Promotion and Research Act is unconstitutional and directed that the collection of assessments cease on July 15. However, the stay postpones implementation of the South Dakota decision and the beef promotion and research program will continue to operate and conduct operations as normal during the pendency of the appeal. This stay was requested by the Department of Justice on behalf of the USDA.

In accordance with this court order, the beef promotion and research program will remain in effect and beef producers and importers must continue to pay beef checkoff assessments. Producers and importers who fail to pay the assessment may be subject to late payment charges and civil penalties of not more than $5,500 per violation.

Virginia Is For Lovers, And Honey Bees
BEEKEEPER LICENSE PLATE

The Virginia General Assembly approved a beekeeper specialty license plate during their last legislative session. With this approval the VSBA is able to move forward in having a license plate supporting beekeeping issued by the Department of Motor Vehicles. DMV requires commitments to purchase the plate from 350 drivers before beginning production. The VSBA is gathering applications for the plate from interested individuals. Copies of the application form will be sent to local Associations in the state, and, if you live in Virginia, you may also contact Keith Tignor, 804-786-3515, to obtain a copy. The cost for the plate is $10.00 in addition to any other registration fees. There is a time limitation. Put your application in soon to reserve your plate.

A design for the plate is needed. All interested individuals are encouraged to submit design sketches and ideas to the VSBA Executive committee for consideration. A logo of 2 1/8 inch wide by 3 inch height is allowable. Four colors, including a dark blue for the license number, may be used. More details for plate design requirements will also be sent to local associations. All entries will be available for viewing at the Winter meeting. A design will be selected by the membership at that time.

SEND YOUR NEWS AND ASSOCIATION CALENDAR AT LEAST TWO MONTHS IN ADVANCE FOR PUBLICATION

A Safe, Soft Chemical May Soon Be Available

MAINE FILES FOR SECTION 18 FOR APILIFE VAR

Maine State Inspector Tony Jadczak informed us in late July that Maine Department of Agriculture, working with the IR-4 project in Rutgers University in New Jersey applied to the Maine Board of Pesticide Control for permission to apply to U.S. EPA for a Section 18 Emergency Exemption Petition for ApiLife Var for the control of *Varroa* mites.

In the Specific Exemption Request, Michael Braverman, a Biopesticide Coordinator for IR-4 outlines some of the details of the request and the product.

ApiLife Var is manufactured by Chemicals LAIF in Italy. It has been used in Europe for a decade to control *Varroa*. The product is primarily Thymol (derived from the thyme plant) along with oregano and basil. It also contains small amounts of eucalyptol, menthol and camphor. This material is formulated as an evaporative tablet weighing 11 grams, with 8.15 grams a.i. The tablets come in polyethylene bags. ApiLife Var must not be used when honey supers are in place, and the average daily temperatures are between 59° and 69°F (remember, that's *average* daily temp).

To treat a typical two-story colony, take one tablet from a bag and break into two to three equal sized pieces. Place these widely apart on the top bars of the top super, not over the brood nest. To prevent the bees from gnawing the tablet either enclose it in an envelope of 8-mesh screen or other metal screen so bees cannot get to it.

After seven to 10 days put in another tablet, and seven to 10 days later place another tablet in, for total exposure time of about 30-31 days.

ApiLife Var tablets must be removed from the hive at least five months (150 days) prior to harvesting (remember, honey supers cannot be on when using this material). It is intended for late Summer or Fall use, after honey has been removed from the colony.

Three cautionary notes: use is most effective when *less* sealed brood is present; do not use when temperatures are above 90°; and use when temperatures are below 54° is not as effective.

You can treat two times per year, but when all of the instructions are considered, a Fall treatment is by far the easiest, and should be the most effective.

When tested at the label rate the maximum residue was 0.06 ppm. Thymol is listed by FDA as a GRAS (generally regarded as safe) and EPA is not aware of any adverse effects. Children are exposed to greater amounts of thymol in chewing gum and candy, and, when applied to a colony using *gloves*, applicator exposure is negligible.

Other states considering Section 18 applications as of late July include CT, NJ, NC, FL, SC, TN and GA. Other states may be doing so shortly.

Brushy Mountain Bee Farm is the U.S. representative for this product. Until a Section 3 (common use) label is granted, they will be responsible for monitoring all sales of the product in the U.S.

Maine applied for this Section 18 because colonies in that state were infested with *Varroa* resistant to both Apistan and Checkmite+. Maine has, according to the report only 325 hobby beekeepers, but over 50,000 colonies come to Maine each Spring to pollinate the blueberry crop. It has been from these colonies that the mites resistant to these other chemicals have initially come from.

Brushy Mountain's Steve Forrest is confident that if a Section 18 is cleared even as late as August this year they will have the paperwork and product ready for Fall treatments.

In a related event, in late July EPA issued a final rule extending existing time limit tolerances for residue in or on honey and beeswax to 12/31/04 in the 46 states with current Section 18 labels for Checkmite+.

Varroa mites were first detected in Maine in November of 1987. Since 1988, beekeepers have treated their colonies with Apistan (Wellmark International, Inc.), a plastic strip impregnated with fluvalinate to control Varroa. After twelve years of challenging Varroa with one pesticide, Varroa mite resistance to fluvalinate is widespread in Maine and the U.S. In August 1999, CheckMite (Bayer Corporation), a coumaphos impregnated plastic strip was granted a Section 18 Emergency Exemption by the EPA and Maine Board of Pesticide Control for the treatment of Varroa and the small hive beetle (*Aethina tumida* Murray). The Section 18 Emergency Exemption for CheckMite was repeated in 2000, 2001 and 2002. During the fall of 2001 a Florida-Maine migratory beekeeping operation was determined to have Varroa with resistance to coumaphos and fluvalinate. A field assay using coumaphos showed only 13.4% mite mortality in Maine vs. 93% mortality for susceptible strains of Varroa found in Maryland. Hive inspections conducted by the Maine Department of Agriculture in the spring of 2002 has identified additional migratory beekeeping operations with coumaphos resistant Varroa. The number of registered hobbyist beekeepers in Maine has declined from 802 in 1984 to 325 in 2001. Most of the hobbyist beekeepers have stated that Varroa mites are the primary reason for colony loss.

DISCUSSION OF ECONOMIC LOSS

According to the USDA, National Agricultural Statistics Service, Maine produced 231,000 pounds of honey in 2000 valued at $173,000 wholesale. The amount and value of honey produced in Maine is minimal when compared to other states. In Maine, the honey bee and beekeeping industry is essential for crop pollination. Maine is the primary producer of blueberries (wild or cultivated) in the world and the blueberry industry contributes between $75-100 million to the state's annual economy. Without adequate supplies of healthy honey bee colonies for crop pollination, blueberry experts claim that the crop would be less than one half of the current yield (5 yr average = 77.6 million lbs/yr). Honey bees are also used to pollinate the state's apple crop which is valued at approximately $25 million per year and Maine farmers also utilize honey bees for pollination of other fruits and vegetables, such as strawberries, raspberries, pumpkins and squash which have an estimated value of $5.3 million per year.

Another aspect of economic significance concerns the mobility of the bee industry. Many colonies are shipped from Maine after blueberry pollination to other states for crop pollination (MA cranberries; MI, OH cucumbers) or honey production (PA, OK, KS, SD, ND, NY, MI). Beekeepers need effective registered controls for Varroa. A Section 18 Specific Exemption for thymol will mitigate restrictions on movement of honey bee colonies.

Approval of this Section 18 Exemption request for the use of Api Life VAR in honey bee colonies will benefit both beekeepers and farmers who rent hives for crop pollination. Api Life VAR is effective in suppressing Varroa mite and is a valuable treatment alternative to fluvalinate and coumaphos. A healthy beekeeping industry is essential for Maine's agricultural economy.

Many colonies in the U.S. have *Varroa* still susceptible to both Apistan and Checkmite+. Beekeepers will soon be able to rotate treatments between three effective chemicals, reducing the opportunity for resistance to develop, and having alternates available if it does.

Imports Still High On Everybody's List

NHB ASSESSMENTS TELL STORY

At the end of June 2002, total National Honey Board Assessments were down $170,115 from the same month last year, or 17 million plus pounds. Imports still exceed domestic sales, $1,024,703, vs. domestic sales at $828,686. The annual assessment of payment for producers will be completed by the end of July.

Display Advertisers

Happy 100, 4-H

Jeff Reed

With An Ohio Start

They didn't realize what they were starting in that courthouse basement.

There were maybe 85 of them, give or take, a mix of rural and urban girls and boys between 10 and 15, who gathered in the basement of the Clark County Ohio Courthouse the evening of January 15, 1902. They came at the invitation of 33-year-old A.B. Graham, superintendent of schools for Springfield Township in Clark County, to hear about a new activity-oriented youth group.

A.B. Graham, founder of 4-H.

They liked what they heard and became charter members of Ohio's first Boys' and Girls Agricultural Club. They then set about working on a variety of hands-on projects, from food preservation and gardening to elementary agriculture. The following year, they exhibited the fruits (and vegetables) of their labors for the first time at the Community Farmers Institute in Springfield, where country and city folk alike took notice.

Three years later, Graham was named superintendent of Extension at The Ohio State University. Meanwhile, his flock of Boys' and Girls' Agricultural Clubs had grown to 20, with 1,036 members around the state. In keeping with a national movement, Graham soon changed the name of his Ohio youth groups to 4-H Clubs, based on the belief that kids can accomplish almost anything with "Head," "Heart," "Hands" and "Hustle."

A century later – and with "Hustle" long since replaced with "Health" – 4-H has evolved into America's premier youth development organization for girls and boys five to 9. With active programs in nearly 90 other countries, 4-H also could have reasonable claim on world domination, as well. In Ohio, more than 286,000 rural and urban kids take part in 4-H programs, with more than 25,000 volunteers helping with local clubs or specific activities.

As 4-H observes its centennial with all sorts of state, national and international events, both private and public, it celebrates the collective efforts of a group of educators and volunteers, not any one individual, as its honored founders, with Graham heading the list in Ohio.

"One in six people living in Ohio has been involved in 4-H, so we have a rich 4-H tradition here in the Buckeye State," said David Farrell, Extension Associate, 4-H Youth Development, and co-chair of Ohio's 4-H centennial committee. "We can't help but be a little bit proud of some of the things we've done and are doing, especially the many things our founder, A.B. Graham, accomplished and inspired." Farrell also points out 4-H has a number of newer programs, such as "Clover Bud," established in 1993 for children five to eight, plus various teen-related programs set up to help teenagers deal with the challenges of coming of age in the early 21st century. "We've got to be willing to change and adapt, to listen and learn – which goes along with Graham's teachings a century later," Farrell said. "A lot of people don't realize that more Ohio 4-H kids are currently from urban and town settings than rural and farm areas.

"I was just listening to some audio clips of Graham from years ago, and he was asked back then what made 4-H so popular and successful," Farrell continued. "Graham said it was the enduring philosophy of 4-H, the philosophy of learning by doing – the hands-on approach – that attracts kids generation after generation. Kids love to learn something by actually doing it, and, through 4-H, they get to know other kids while doing it. It's appealing, it's timeless."

Ohio's 4-H centennial celebration will kick into high gear the next several months, with some sort of commemoration encouraged at all 88 county fairs.

A "Weekend of Celebration" will take place September 6 – 7 in Columbus, beginning with the Celebration of Youth fundraiser September 6 at the Aladdin Shrine Center. The next morning, 4-H officials will break ground for the long-awaited Ohio 4-H Center at the corner of Lane Avenue and Fred Taylor Drive at The Ohio State University.

This Summer, Ohio 4-H will publish a commemorative history book showcasing 4-H milestones in all 88 counties. Throughout the year, it'll be collecting 4-H memorabilia for display, plus selling commemorative centennial items, including shirts and hats. Ohio 4-H also has set up a statewide centennial speakers' bureau, with 135 eager adults and teenagers primed to talk about 4-H at meetings and special events.

"It's a big year for us, no doubt about it," said Farrell. "I grew up in Clark County, where Ohio 4-H started, which I always thought was pretty neat, and I've gone on to work with 4-H all my adult life. The world has changed a lot since Albert B. Graham gathered that first group of kids together for their first monthly meeting. At the same time, many things Graham believed in and taught remain the same, which is the beauty of 4-H, things like what 4-H stands for – 'my Head to clearer thinking; my Heart to greater loyalty; my Hands to larger service; and my Health to better living. Those are good words to live by today as they were a century ago."BC

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