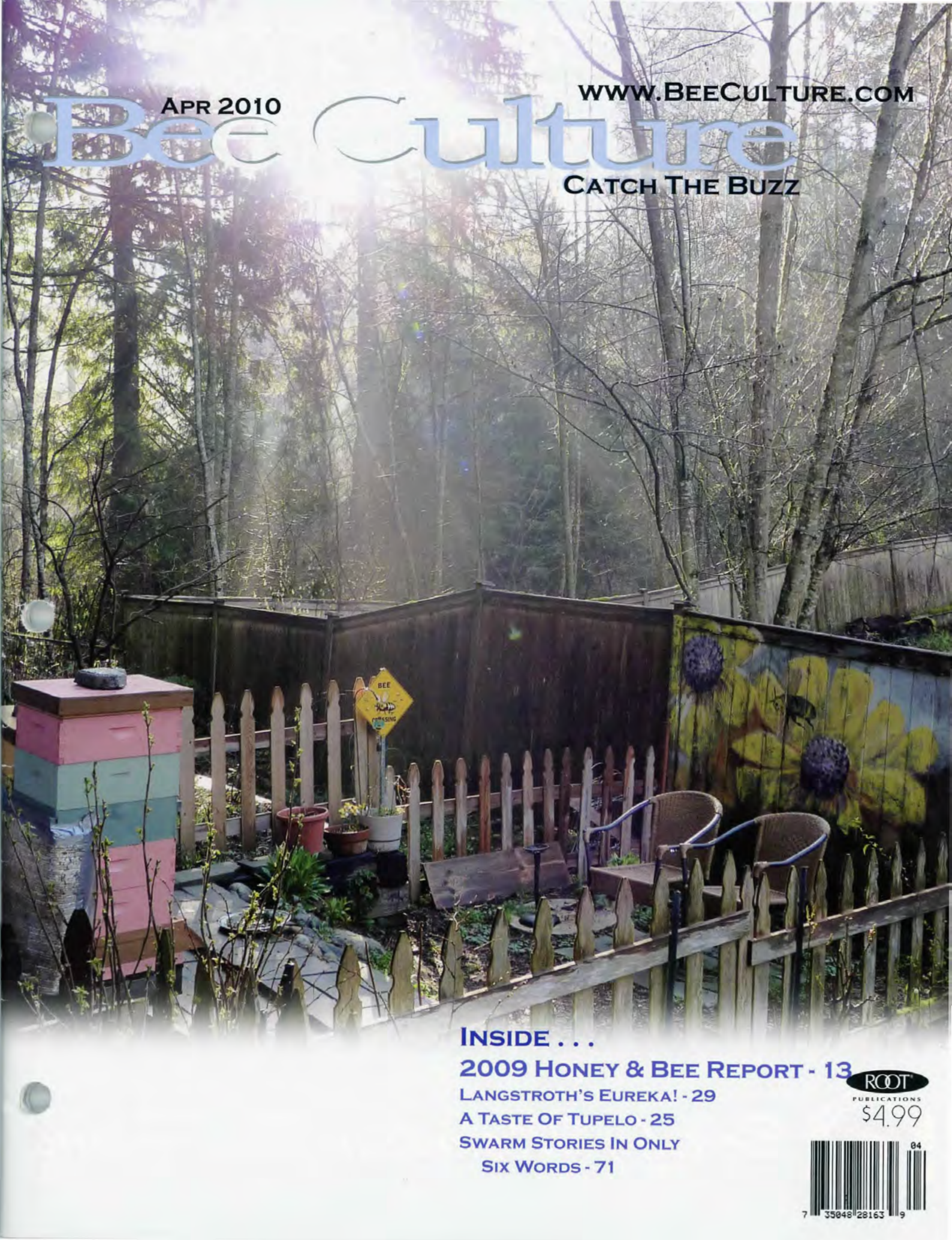

APR 2010

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Can you imagine a more tranquil and beautiful setting to just go and watch your bees? Not sure if you'd call it a gated community or not, but photographer Franclyn Heinecke in Puyallup, Washington refers to this as her Temple To The Bees.

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Subscription Information

U.S., one year, $25; two years, $48. Newsstand price: $4.99. All other countries, (U.S. Currency only), $15.00 per year additional for postage. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), April 2010, Volume 138, Issue 4, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Contact Information, Book Orders

V800.289.7668 • V330.725.6677, Ext. 3220 • F330.725.5624

www.BeeCulture.com; email: info@BeeCulture.com

Advertising

For information on advertising contact Dawn Feagan at 800.289.7668, Ext. 3220; Dawn@BeeCulture.com; www.beeculture.com

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

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

APRIL 2010 VOLUME 138 NUMBER 4

FEATURES

DEPARTMENTS & COLUMNS

GLEANINGS-73, CALENDAR-76, CLASSIFIED ADS-77

Almonds Next Year?

Beekeepers going to California almonds next year – 2011. Make arrangements now with almond growers for next year. Use a signed contract and set a price. This year's range of prices for eight-frame colonies seems to be $130 to $160. Next year's price range might be similar, but is negotiable. If you need more growers, you can take several steps now. Consult other beekeepers. Consult your current growers. Advertise on Craig's List. Advertise in Classified Ads in *Almond Facts*, P.O. Box 1768, Sacramento, CA 95812, 916.442.0771. Advertise in *AgAlert* Classified, 2300 River Plaza Dr., Sacramento, CA 95833-3293, 916.561.5572. It's never too early to prepare for next year. The growers will thank you.

Alan Buckley
Portola Valley, CA

Regional Queens - Difficult But Necessary

I enjoyed the recent article dealing with queen rearing programs. Having been personally involved in "area specific" queen rearing programs in the past, I found the article to be very truthful, as well as relevant. Many queen rearing programs fall into an "ebb and flow" of members, due in part to their misunderstanding that small scale queen rearing can compete on a level playing field - considering time, labor, specialized equipment, inconvenience, added stress to your bees, and financial gain, with small scale honey production. This statement assuming the producer would gross $20 per queen, and $4 per pound for honey.

Many aspiring queen producers fail to calculate the number of bees needed for mating nucs and cell builders in comparison to the number of mated queens these bees will allow you to produce. Even if the individual uses mini-mating nucs, and to fill them shakes bees from a populous hive, the one hive that is depleted of young bees to create ten mini-mating nucs will usually average a yield of seven mated queens, which will gross $140. This same hive, with a heavy population of bees in a good honey flow will yield 100 pounds of honey @ $4 per pound. Even if the hive yields half the projected amount of honey and all 10 queens return to their nucs mated, (making the gross equal, financially) there remains an imbalance in labor, equipment and inconvenience.

With this said, the reasoning for starting – and maintaining – a queen rearing group reverts to the desire for a regionally adapted stock, where the mating process and genetic input is known, and dependence on outside sources – over which the local beekeeper has no input or control – is lessened. I understand that everyone may not agree with my observations, but in my area, this is the reality we deal with. In conclusion, I think it is very beneficial for beekeepers in any region to make an effort to develop their own stock, and using the format of a collaborating group of queen producers is a really good method to achieve this goal. I think the producers should also be aware that they are probably not going to retire to the Bahamas on their queen-rearing profits.

Kent Williams
A Mid South Beekeeper

Regional Queens - Wild Things In A Box

I want to tell you how much I appreciated your writing about local queen rearing. It needs every bit of encouragement we can give, because I see it as the only hope for a beekeeping future.

As a beekeeper of 46 years with 38 years queen rearing experience, I would like to add some thoughts. Years ago, (pre-mites)we wintered about 1500 colonies each winter from Northern Kansas up into Northeastern Nebraska, and depending on the year our losses varied. These bees were on permanent locations, never fed, just survive the fittest. Spring and Fall they got a dose of Terramycin. Many of these colonies lived for years and years.

As the yards got low on colony count we would boost the numbers with nucs made in Texas each Spring. Some yards would survive well enough they rarely needed adding colonies. We would watch individual colonies who year in and year out, out performed their yard mates and every year we would select a few to go to Texas as breeder Queens for our nucs. Because of the isolation, longevity and geographic disbursement of our bees, genetic diversity was built in. These bees thrived and performed well for us because they had been selected and bred from stock that was suitable specifically to our management. So you see breeding survivor bees has always been our game plan and I feel it has been the key to our commercial beekeeping success.

Then came the mites. Tracheal mites were initially devastating, wiped out most of those wintered yards and wreaked havoc on our Texas bees too. But, lo and behold some hives, one or two out of a hundred were fine! Dr. Marion Ellis was the Nebraska inspector at the time and he taught us how to dissect bees and we bought a microscope. We went to sampling bees in all states of condition and what did we find? Some of the best colonies had as high or higher mite infestations! Bingo! The old light bulb came on! We realized that instead of looking for bees that did not have tracheal mites, we should breed from bees that thrived ***despite*** tracheal mites. We put the microscope away.

It always has puzzled me how few people ever grasped this, for years and perhaps still, they were

Missing Info

In the January issue the photos for Jennifer Berry's article were taken by Cindy Hodges, but not credited to her.

looking for bees that did not have mites. What did that matter as long as the bees flourished? I will get back to this.

Yes, and as you said then came *Varroa*. And we believed we could whip them, too. What a long road, what a fight, what a battle, what a war! 23 years now. Apistan was great we thought, then it failed. PMS reared up. Many beekeepers got out their chemistry sets. The wild bees vanished. We found, eventually, bees that lived with *Varroa*, but they sure did not thrive. Our progress was almost undetectable. Then came the Russian stock.

At the urging of Kirk Webster of Vermont, who I had come to know over the telephone thru the tracheal mite battle, we started grafting from Russian Breeders. In 2004 we found neither fluvalinate or coumaphos would control mites and after a bit of research we used oxalic acid drench the Falls of 2004 and 2005, no treatment at all in 2006, and in 2007 we used Apiguard on some colonies only to decide it really did not make much difference. Sure, it dropped mites but the untreated colonies performed as well as treated. So, in 2008 and 2009 we sent bees into the almonds, and produced decent honey crops in South Dakota with untreated bees and no fancy tricks.

This past year we used no mite treatment, no antibiotics, no fumagillin. Have I lost bees? Has it cost me money? You bet, both accounts. Now its February 2010. I am hearing of atrocious Winter losses, bee shortages in the almonds. People who gave their bees every possible treatment are losing 30, 40, 50 on up to 80% of their bees. So I have a 40% loss, and some live hives that do not look good. But I did not spend one minute, or one dime on treatments of any kind. And I have some beautiful survivors for drone and queen stock. And it looks like all my hives will have bees in them again with out any outside input.

Enough about me. There are lots of survivor bees out there. Wild bees are back most everywhere. I get frequent calls from small beekeepers who just gave up in frustration on treating and have built back from survivors and say their bees are doing great. I cannot say how important I believe it is to encourage and support beekeepers in the rearing of locally adapted survivor (no treatment of any kind) stock. I am often asked how to keep bees with out treating. My answer: do not treat them. Take your lumps and go forward.

Now, queen rearing. To you who have no experience, just try. Do you think everything works perfectly for us of long experience? Think again. It is a life time learning experience. But if you never start you will never learn. Queen rearing can be as basic as dividing a good hive several ways and allowing the queenless portions to rear their own. There are many articles and books to read on the subject. But a word of caution here: Do not believe all you read! The same goes for what you are told! Unfortunately, some people are on a power trip, they want you to think they know something you never can or will. When I hear or read something on this subject often I think what in the world are they talking about or why would they do that? This is not magic, not hoo-doo voodoo! If you have good basic understanding of bee biology, you are set. If your eyes are bad, get the neighbor kid to graft for you. It takes absolutely no knowledge of bees to transfer larvae from comb to cell cup, just good eyes and a steady hand. The cell building is what does take some smarts. Decide on a method and go for it. With experience, you will get better. Tweak the system I say and still do.

Now the stock selection, first quit those treatments for mites. Forget screened bottoms, Forget sugar dusting, Forget small cell foundation, Forget drone brood removal. Just let the bees be bees. Surely you or a friend will have or know of survivor bees to start with. If you are in an area with few other beekeepers, great. Your queens will have a better chance of mating with drones of untreated stock. While I am mentioning drones, remember they are 50% of this deal. Forget that drone congregation area business. Queens only fly as far as they have to to mate. I use abundant drone source colonies, and many times I have observed virgins mating directly over the yard of nucs.

This is *heresy*, but oh well. Bees apparently have many possible ways of dealing with mite infestations and in their ability to resist viral and bacterial infections. As with my own tracheal mite light bulb, the most important thing here is propagating bees that will survive for you and do well for you where you are and under your management. Do not let some expert tell you all the tests you need to run, all the special traits you should pursue.

First and foremost we want our bees to live, if it is a mystery how they do it, so be it. We want our bees to live.

So, Kim, we are not out of that tunnel, but there is a light and it is not a train. We just have to keep moving towards it. Remember, a journey of a thousand miles begins with a single step.

Sometimes I wonder, we may be at an evolutionary split. I have always said that we keep wild things in a box. I hope always to keep wild things in a box. But as commercial beekeeping becomes more and more like factory farming, will bees become truly domesticated with all the coinciding weaknesses and foibles? Why does man have to feel so smug and superior? Why are we so sure we have the answer to everything?

Look how the world has changed! Scary isn't it. I have read articles mentioning genetically manipulating bees. Oh please, Beam me up, Scotty! I just want to keep my wild things in a box. I hope you do to.

Chris Baldwin
Belvidere, SD

Q & A - Remedy

Last June a reader of *Bee Culture* was asking about a tree called Curl Leaf Mountain Mahogany (*Cercocarpus ledifolius*). I am able

Continued on Page 10

to give the reader more details if he writes to me at the address shown below.

Abbas Edun
17 Samuel Teitel Court
Scarborough, Ontario M1X 1S7
Canada

About Sodium Diacetate

For over two years I have been trying to get *somebody* responsive about Sodium Diacetate (SDA).

To begin with, SDA is so safe it is used widely in food products. It is even more digestible than table salt (no chloride). SDA is an antimicrobial, which stops growth of the AFB and EFB organisms. And it is so safe for the environment – biodegrading into sodium, water, and carbon dioxide (whoops).

I have been involved in pilot tests, which have verified its success in the control of AFB and EFB. What happens? By preventing growth, the bees take care of the disease by letting the existing organisms die of old age. This, admittedly, is an oversimplified description. But it does the job – with no toxins and almost no worry in the event of overdose.

I do submit that SDA is worthy of being researched – for the reasons stated.

John Straub
Winnetka, IL

Loan Funds?

Who will receive most of the ELAP (emergency loan program) funds? Australian package suppliers and the middle men. When I called the head WA State USDA office, and informed them of the policy's failures, they adamantly stated "We aren't going to pay for Australian bees," my response "to heck you're not!"

Even the U.S. based bee supply companies will be required to purchase replacement stock from Australia to qualify for ELAP, as in house restocking doesn't qualify.

The only way you can receive ELAP funds is to first come up with outside money, purchase replacement bees, then apply for ELAP funds. Those who cannot find that miracle money simply won't qualify for their losses!

For most commercial beekeepers, this means they will have to maximize their cash flow, the maximum is by pollinating almonds. ***This means restocking dead outs with packages from Australia.*** ELAP requires documented receipts. Losses recouped from splitting and raising your own queens do not qualify. What does qualify is clear purchase of hives, nucs, package bees, surprisingly queens.

The demand for bees drops dramatically after almonds, and how many beekeepers can compete with the low Chinese honey prices through honey production?

Had I filed for honey crop loss by December 10, 2008 for the 2009 year, I could then have filed for the 2009 ELAP funds. I *honestly* did not intend to produce honey for the year, but to maximize colony production by raising my own queens and splitting and restocking my own empty equipment. So when CCD struck, I found out I did not qualify. Insult to injury.

All other expenses of the operation don't count. The expenses of forcing population growth through feeding sugars and proteins are meaningless.

USDA wants to know how many hives you register with the state. Washington State's registration requires us to register the number of hives we will own, lease, increase, borrow, buy, steal, receive as gift, manage, etc., all of this is to be known and registered by March 1 of the same year. This makes the registration data meaningless! One of our biggest beekeeper uses vaulted numbers for political prestige and thus, leverage.

For the acreage issue, Colorado demands copies you hold with every landholder where you place beeyards. Every effort was given to turn away beekeepers from signing up for their losses. I predict because of this still more beekeepers must quit the bee business. More importantly new investments and time will be contributed by the newbee's wanting to get in to the business, ignorant to the hazards. This new fodder and their investments will go into the sink hole largely unnoticed.

Chester Ferguson
Yakima, WA

Records Tell The Story

I've been keeping records of my bees since 1979. I've had bees since 1958, but until I had more than 10 hives I never kept records.

In looking back on some of these I've discovered in or about 1990 my bees began to have trouble. At this time I had over 100 colonies and had been retired for three years. My plan was to raise bees for honey and trap fur-bearers for fur.

In 1987 I was 55 years old and had 36 years in at the paper mill, working three shifts. Every seven days we would change. It was a good job with good pay and benefits, but a poor retirement plan. But it worked out OK. My wife went along with my plan and never complained. That's her nature and I'm grateful for that. She's the best, and pretty too!

Bees and trapping are the two things I've always wanted to do. Well in 1987 the Tracheal mite made its appearance and I started noticing a lot of "crawlers" quite a distance from my hives. But bees seemed to be doing OK. In the Spring of 1990 all hell broke loose. I went from 115 hives down to 12. My retirement plans were hit hard. Ten years later Washington voters told me I can't trap anymore – well I could trap but couldn't use traps, only cages.

All my beekeeping friends said if you don't treat for the "mite" you won't have any bees!

Along came an array of "cures" tac-tic, mite-a-cure, essential oils, menthol and others. I used em all. Did it help. Maybe, but it might have done more harm than good.

This time all or most all "bee trees" were gone. It became a waste of time to put out bait hives for swarms in the Spring. What to do?

Twenty miles from home there are cranberry bogs and every year about the first of June pollinators

bring in about 1,000 hives and leave them for about a month. So that's where I went with my bait hives. I put them back up on the hills above the bogs and picked up quite a few swarms. I did this for three years. What I noticed about *most* of these bees was how gentle they were and what big colonies they built and what little honey they stored? Poor bees for a honey producer.

So finally I come to the point of this letter. Did the mite kill off most of our "wild" bees? And did the "Pollinators" reestablish these gentle bees?

All I know is in the last 10 years I can pick up swarms with bait hives again without going to the cranberry bogs but they don't seem to be honey producers, but are nice and gentle.

My main mite control now is screened bottom boards for *Varroa*. The Tracheal mite seems to cause little problems anymore.

Jim Cowan
Aberdeen, WA

Feeding Hives & TBH Idea

Adding some information to Michael Bush's hive top, table sugar feeder (January 2010 by Erik Osterlund). My mentor Clarence of Howell, MI. He is 84 and only sells honey. His son now runs the hives.

When he had 500 hives he would screw a ¾ x ¾ strip around the shallow side edges of the inner cover. Then he would fill it, except over the escape hole, with five pounds of sugar and leave it on all Winter. I am doing one better on six of my hives, I have 12. I mixed one cup of soy flour with the five pounds of sugar. Soy flour is 35% protein.

In response to Dick Largen and "Top Bar Hives," January 2010. Not being a carpenter either, but wanting to try a Top Bar Hive I took two mature brood boxes, removed one side from each, joined the two together by gluing and screwing (drywall screws) a piece of half inch plywood to the exterior. Small blocks, ¾ x ¾ x 1½ filled in the rabbeted teeth. On the inside I screwed and glued side pieces (full length) at approximately 15°, to create a square box outside, with a tapered inside. Now! Just put 20 to 21 top bars into the long hive – standard store bought top bars. Good luck.

Bruce Sabuda
Pinckney, MI

Climate Comments

When I read Jennifer Berry's article about Dr. Esaias's colony weighing project in the February 2010 issue of your magazine I couldn't help but smile. It appears the wheel has been reinvented with perhaps a new twist or two. In the October 1, 1899 issue of *Bee Culture* page 716, colony weighing was discussed using a commercially available "$5 scale" or one could be built by the beekeeper. A home built scale was discussed using wood left after a California wild fire. Here's a quote from the 1899 article,

"...we were talking about the sudden yields of honey that sometimes favored the bee-keeper, and how handy it is to have a colony placed upon scales in order to tell just how many pounds the colony was gaining or losing each day. My Wisconsin friend said he had a colony on scales all through the honey season, and a glance at it showed whether the conditions were encouraging or discouraging"

I had the privilege of attending a lecture given by Dr. Esaias on this subject. While the idea of tracking precisely when the honey flow starts and ends each year is interesting, I do not subscribe to his premise that the bees and flora may some how fall out of sync with one another to the detriment of the bees or environment. Here in Maryland when it's warm the bees are actively seeking food whether it's present or not, they will live on stores until it becomes available, as they do each year. One can observe honey bees actively flying around the yard on every warm day of the Winter, often in January (I was stung on the neck this Jan). Yet the Maryland honey flow doesn't occur until around the second week of May. Or a four month lag between first bee activity and the honey flow. A couple hundred miles to the south of Maryland the honey flow is sooner and to the north it's later. By their very nature, bees are commonly

"out of sync" with food sources with no detrimental effects. Whenever the flora is producing pollen on a warm day, the bees will be ready. In Maryland what seems to have the most detrimental effect is the length of the honey flow which is typically only a few weeks long.

Jerry Ballman
Millersville, MD

Climate Is Dynamic

In my first look through the February 2010 *Bee Culture*, I was quite disappointed to read the following in Jennifer Berry's article:

"Now, regardless of your stance on global warming (whether you're a card carrying environmentalist, global warming supporter or a Limbaugh-Hannity following, global warming basher), the earth is experiencing worldwide climate changes."

My flippant reply would be, "Yes, the world was a much better place when the climate was static . . . which was when, exactly?"

More to the point, however, Jennifer leaves no room for environmentalists that are critical of the data presented, and casts all doubters as some kind of army of cartoon republican robots . . . whereas those that are "global warming supporters" are environmentalists.

Anyone who is interested in this subject already knows the arguments on both sides of the issue, and I have no desire to revisit them here . . . nor do I really want to read about them in *Bee Culture*.

The only thing worse than having this discussion in *Bee Culture* is to have the contents of the magazine reflect such an overly simplistic view of who believes what. There are many environmentalists (myself included) who don't buy all the hype . . . yet, we are intelligent critical thinkers.

The climate is changing, yes. The climate has always been

changing. The climate will continue to change. To point this fact out is akin to pointing out that during the day, the sun moves through the sky.

There are many good reasons that we "should be better stewards of this planet . . ." I'm not sure why we have to use global warming to make this point anymore than I think we have to recognize a god driving a chariot across the sky because we see the sun rise and set.

Dean Stiglitz
Leominster, MA

Getting Apitherapy Bees

In your February 2010 issue of *Bee Cullture*, Sheri Kirsch asked about getting bees in Winter for use with MS-apitherapy. My wife has MS and did bee sting therapy for six years until she had heart problems and had to quit because of her heart meds. I live in Virginia (not as cold as Montana) and got bees year round. I drilled a hole in the rear of the hive and plugged it with a wood peg. In Winter, with patience and some warm breath blown into the hive, bees would eventually come to investigate. I would also tap or scratch on the hive.

We were fortunate to meet Pat Wagner who was stinging people in her home three times a week and later Charles Mraz. My wife went with Pat to California for a TV program and later to Charle's 80th birthday celebration at his home when he was honored by people coming from Europe, Asia, and N and S America.

If you could send her this information or have her contact me it would be appreciated.

Donald Chandler
Virgilina, VA
coss@pure.net

Half Inch Solves The Whole Problem

In the Mailbox section of the February 2010 issue: (1) John Hoffman talks about positive uses of ½" mesh (hardware cloth); (2) Colin Taylor has clogged mouse guards; while (3) Ben & Teri Whitney worry about snake "Bob" entering the hive.

I have kept bees for 30 years and have used ½" hardware cloth on all of my hives for well over 25 of those years. The cloth is left on the hives year around. It is stapled in place over the bottom entrance opening and extends out three to four inches beyond the end of the flight board. A small piece of cloth is also stapled over the opening in the inner cover. The cloth will keep out most pests; including mice (Colin), snakes (Bob), skunks, etc, and not easily clog. The reason for the 3-4" extension is to keep skunks and other animals away. Skunks and other animals have tender underbellies. When the animal tries to place its paws on the front of the hive to scratch near the entrance; it gets poked in the gut by the sharp wires of the cloth. Unfortunately with bears the cloth just slows them down for a second or two, and really makes them angry.

When I first started keeping bees and did not use the cloth I had mice, snakes, skunks, and other problems. I've had no such troubles since the cloth went on. Great magazine.

Steven March
Beaver Springs, PA

Snakes . . . And Mice

Please tell Ben and Teri Whitney from Florida that black snakes eat a lot of mice. There is a good chance there is or was a mouse hiding out in that weak hive. The next time they work bees they might inspect down to the bottom board to be sure there aren't any mice inside, and then when they close up they could install a mouseguard.

Mary Ellen Kirkpatrick

Count Your Zippers & Your Blessings

There I was, all suited up with the top of the hive open. The bees were particularly feisty and this hive at Sunfield Farm was not my favorite. I suspect they were a hybrid of some sort but don't really know since I had volunteered to care for them after the previous beekeeper left. So I was treating them with all due respect and care when I noticed that part of my blue shirt was sticking out of the zipper in my bee suit. In fact, my bee suit wasn't zipped up at all and there were hundreds of bees on my shirt and now inside my suit.

The next scene would have been a hit on YouTube but unfortunately nobody was around to film it. I went racing down the wide-open field in a panic, shedding my veil, gloves, boots and eventually the entire suit while I ran for my life with a stream of bees in pursuit. The queen guardian of beekeepers must have been smiling down on me that day since I did not get a single sting!

So what's the moral of this story? If you have a zipper on your blue jeans and you are fully suited up and you need to make a rest stop, remember to count the number of zippers you zip down and then zip up again. And count your blessing every day!

Kees Kolff
Port Townsend, WA

U.S. Honey Production – 2009

Honey production in 2009 from producers with five or more colonies totaled 144 million pounds, down 12 percent from 2008. There were 2.46 million colonies producing honey in 2009, up five percent from 2008. Yield per colony averaged 58.5 pounds, down 16 percent from the 69.9 pounds in 2008, and is the lowest yield since 1989. Colonies which produced honey in more than one State were counted in each State where the honey was produced. Therefore, yields per colony may be understated, but total production would not be impacted. Colonies were not included if honey was not harvested. Producer honey stocks were 37.2 million pounds on December 15, 2009, down 27 percent from a year earlier. Stocks held by producers exclude the 5.0 million pounds held under the commodity loan program. You can download the complete report at **http://usda.mannlib.cornell.edu/usda/current/Hone/Hone-02-26-2010.txt** for additional information and detail.

We use and incorporate this data for further analysis each year including the top 10 producing states (see the chart). The amount of honey produced by the top 10 states seldom changes as a per cent of the total U.S. crop produced, but this year two states dropped off the list . . . Wisconsin and Georgia . . . and were replaced by Texas and Louisiana. This is a first for Louisiana, and even though they had 8% fewer colonies this year than last, their production/colony was the highest in the nation last year at 103 pounds per colony. Those Bayou Bees must have been on steroids last year.

Honey prices certainly took a positive turn at the retail shelf level this past year, going from $1.976/pound last year to $2.78/pound this year. But meanwhile, at the beekeeper level . . . that is the All Honey price . . . the increase went from $1.41 to $1.44/pound...almost not worth mentioning. One can't help but wonder where that $1.339 difference is going?

We stumbled across some other interesting data this year regarding colony counts by state. We found a credible report for colony counts by state for 1909, then retrieved 1959 USDA colony counts, and of course had the 2009 colony counts just released which gives us a span of 100 years. The differences are striking. The list of eight states at the bottom of the chart need clarification. For 1909 and 1959 data the USDA counted colonies from these states individually so there are numbers for each state and there is a total for the group. However, USDA no longer publishes individual data for each of these states because there are so few producers that have more than five colonies and each wants their identity protected. As a result USDA releases only the total of all combined . . . thus the total-only for 2009. The 55% drop from 1959 to 2009 is dramatic.

We've added another chart this year that shows colony counts and honey production by year for the last

Honey: Number of Colonies, Yield, Production, Stocks, Price, and Value by State and United States, 2009[1]

State	Honey Producing Colonies[2]	Yield per Colony	Production	Stocks Dec 15[3]	Average Price per Pound[4]	Value of Production[5]
	x1,000	Pounds	x1,000	Pounds	Cents	1,000 Dollars
AL	9	49	441	66	182	803
AZ	20	52	1,040	562	153	1,591
AR	24	57	1,368	301	139	1,902
CA	355	33	11,715	2,109	139	16,284
CO	28	53	1,484	326	140	2,078
FL	150	68	10,200	1,428	138	14,076
GA	65	41	2,665	346	147	3,918
HI	10	95	950	323	163	1,549
ID	103	46	4,738	1,706	145	6,870
IL	8	34	272	57	226	615
IN	9	32	288	101	198	570
IA	26	42	1,092	339	151	1,649
KS	9	63	567	164	189	1,072
KY	5	35	175	25	273	478
LA	37	103	3,811	610	132	5,031
ME	6	50	300	51	186	558
MI	66	60	3,960	1,505	151	5,980
MN	122	65	7,930	1,427	140	11,102
MS	14	104	1,456	87	132	1,922
MO	11	47	517	57	198	1,024
MT	146	70	10,220	3,577	145	14,819
NE	48	56	2,688	1,102	144	3,871
NV	10	52	520	57	129	671
NJ	9	32	288	46	193	556
NM	7	60	420	143	163	685
NY	47	65	3,055	978	183	5,591
NC	11	45	495	84	252	1,247
ND	450	77	34,650	7,623	137	47,471
OH	11	50	550	132	275	1,513
OR	55	34	1,870	767	149	2,786
PA	21	40	840	319	199	1,672
SD	270	66	17,820	6,237	139	24,770
TN	7	51	357	86	235	839
TX	74	63	4,662	886	138	6,434
UT	26	38	988	198	147	1,452
VT	5	49	245	69	236	578
VA	6	39	234	56	328	768
WA	62	44	2,728	1,064	149	4,065
WV	5	37	185	33	267	494
WI	63	60	3,780	1,588	151	5,708
WY	37	48	1,776	391	143	2,540
Other Sts[6,7]	15	51	768	127	280	2,150
U.S.[7,8]	**2,462**	**58.5**	**144,108**	**37,153**	**144.5**	**208,236**

[1]For producers with five or more colonies. Colonies which produced honey in more than one State were counted in each State.
[2]Honey producing colonies are the maximum number of colonies from which honey was taken during the year. It is possible to take honey from colonies which did not survive the entire year.
[3]Stocks held by producers.
[4]Average price per pound based on expanded sales.
[5]Value of production is equal to production multiplied by average price per pound.
[6]CT, DE, MD, MA, NH, OK, RI, and SC not published separately to avoid disclosing data for individual operations.
[7]Due to rounding, total colonies multiplied by total yield may not exactly equal production.
[8]Summation of States will not equal U.S. level value of production.

Honey Prices 1995-2009

Cents/lb.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All Honey	68.5	87.8	75.7	65.5	60.1	59.7	70.4	132.7	138.7	108.5	90.4	104.2	103.2	141	144.5
Retail Shelf	100.0	117.3	125.7	114.7	126.6	130.4	142.2	152.5	188.5	188.7	183.3	191.0	196.1	197.6	278.4
%Difference	31%	25%	40%	34%	53%	54%	51%	13%	26%	42%	51%	46%	29%	28%	48%

10 years for easy comparison. This graphically demonstrates the steady decline in both colony numbers and total production. If that 30% drop in colony numbers continues at the same rate in 10 years there will be only 1.7 million colonies, and in 20 years just over a million. Production in 10 years will be down another 10% to 124 million pounds, and in 20 years down to about 115 million pounds. The drop in honey production won't be as dramatic as colony count it seems, but still . . . Imports will then will rule the day. That seems to be the future of all of our food it seems.

One other analysis we compute every year is per capita consumption of honey . . . how much does each individual eat each year in this country. To arrive at the figure we take total imports, plus any stocks carried over from last year, plus any honey under loan plus all of our domestic production, then subtract the total amount of honey exported. That figure is divided by the average U.S. population for last year, and the per capita amount is calculated . . .

Imports	211,418,251 lbs.
+ Production	144,108,000 lbs.
+ Stocks	37,153,000 lbs.
+ Under Loan	5,000,000 lbs.
= Total	397,679,251 lbs.
- Exports (minus)	28,924,255 lbs.
= Total	**368,754,996 lbs. Used in U.S. 2009**
Divided by Pop.	307,006,550
= Per Capita	**1.20 lbs./person (19.2 ounces)**

This per capita amount has not changed significantly in decades – certainly not in the many years we have been computing it. About a pound per person per year has been, is, and it seems will be the figure to use. Variations tend to be influenced more by loan program numbers than anything. We've seen it go from a low of about .85 pounds/person to a high of 1.25 pounds, but the overall average is right about a pound.

Certainly the amount of honey imported last year bears scrutiny. USDA figures indicate over 211 million pounds were imported in 2009. This is less than in 2008 when U.S. beekeepers produced more honey (2008 = 163.8 million pounds produced in the U.S., while importing 231.8 million pounds vs. 2009 = 144.1 million pounds produced in the U.S. while importing only 211.4 million pounds). So the red flag has gone up on why there was less honey imported during a year when there was also less honey produced domestically with a steady to increasing demand. Lots of red flags, actually. It should be no surprise that the quality of those imports, and, more critically, the amount of products that were imported that claimed to be honey blends, (thus avoiding the duty that pure honeys have to pay when entering the U.S.) is in question. U.S. Customs and Commerce are also actively investigating (and in a few cases have arrested and prosecuted individuals) suspected incidents of circumventing these duty laws by sending honey that originated in China through a second country, avoiding the duty payments. Time will tell.

A major consideration for this data is that NASS does not collect data from beekeepers with five or fewer hives. There is much debate about the colony count and hon-

Colonies 1909 - 2009
All Numbers x000

STATE	1909	1959	2009
AL	133.1	191.	9
AZ	23.8	100	20
AR	92.7	89	24
CA	201.0	570	355
CO	71.4	68	28
FL	38.9	277	150
GA	130.5	213	65
HI	-	-	10
ID	21.3	195	103
IL	155.8	153	8
IN	80.9	178	9
IA	160.0	154	26
KS	73.7	43	9
KY	152.9	118	5
LA	29.6	92	37
ME	7.6	6	6
MI	115.3	144	66
MN	56.7	265	122
MS	74.4	78	14
MO	203.6	128	11
MT	6.3	82	146
NE	45.6	61	48
NV	8.4	9	10
NJ	10.4	33	9
NM	10.1	11	7
NY	156.5	187	47
NC	189.2	196	11
ND	0.5	32	450
0H	98.2	268	11
0R	47.3	55	55
PA	124.8	143	21
SD	6.6	59	270
TN	144.5	160	7
TX	238.1	260	74
UT	26.2	54	26
VT	10.2	11	5
VA	104.0	136	6
WA	33.9	100	62
WV	110.7	103	5
WI	95.6	192	63
WY	4.6	37	37
MD	23.2	30	-
NH	4.6	8	-
RI	1.8	2	-
CT	9.4	13	-
MA	7.5	18	-
DE	0.4	13	-
SC	75.4	59	-
OK	19.4	45	-
SUB	141.7	188	15
TOTAL	**3445**	**5438**	**2462**

Top Ten Producing States Each Year

2005			2006			2007			2008			2009			
State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	x1000 Col	x1000 Prod lbs	State	X1000 Col	Colony % Change	X1000 Prod lbs
ND	370	33.7	ND	350	25.9	ND	420	31.1	ND	390	35.1	ND	450	+12%	34.7
CA	400	30.0	CA	380	19.8	CA	340	13.6	SD	225	21.4	SD	270	+17%	17.8
SD	220	17.4	FL	170	13.8	SD	255	13.3	CA	360	18.4	CA	355	1.4%	11.7
FL	160	13.8	SD	225	10.6	FL	160	11.4	FL	150	11.9	MT	146	+8.2%	10.2
MN	120	8.9	MT	132	10.4	MT	135	9.2	MN	122	9.5	FL	150	0%	10.2
MT	130	8.7	MN	125	10.0	MN	130	8.8	MT	134	9.4	MN	122	0%	7.9
TX	84	6.0	WI	64	6.0	TX	105	8.6	MI	71	5.2	ID	103	+13%	4.7
WI	64	5.3	TX	82	5.7	ID	92	3.8	TX	77	4.9	TX	74	-4%	4.7
MI	65	4.4	ID	95	4.2	MI	72	4.6	WI	58	4.6	MI	66	-7%	4.0
ID	95	3.5	MI	72	4.0	WI	60	5.0	GA	55	3.9	LA	37	-8%	3.8
Total	1708	131.7		1695	110.4		1769	109.7		1642	120.3		1773		109.7
All Sts.	**2410**	**175.0**		**2392**	**154.8**		**2442**	**148.5**		**2301**	**160.9**		**2462**		**144.1**
% of Tot.	**71%**	**75.3%**		**71%**	**71.3**		**72.4%**	**73.8**		**71%**	**75%**		**72%**		**76.1%**

ey production contributions small scale operations would make when considering the big picture. One estimate is that about half the hives in the U.S. are used for almond pollination each year, and there are about 1000 commercial beekeepers in the U.S. It is reasonable to assume that most of the almond hives are owned by most of the commercial beekeepers, leaving about 1.2 million hives in the hands of sideliners and backyard beekeepers. *Bee Culture's* surveys over the years have estimated the number of sideline operations at between 4,000 - 5,000, averaging 100-300 colonies. It is certain that small scale, that is sideline and backyard beekeepers do contribute to the overall picture of how much honey is consumed in the U.S. each year, but it remains an unknown. And, since the NASS data misses these beekeepers each year, their counts are consistent, given the confidence levels they state at the end of their report.

10 Years; Colony & Honey Production

YEAR	COLONIES (x000)	PRODUCTION (000 lbs)
1989	3528	180.6
1990	3220	198.7
1991	3211	220.9
1992	3045	221.7
1993	2875	230.6
1994	2783	218.2
1995	2655	211.1
1996	2581	199.5
1997	2631	196.5
1998	2637	220.5
1999	2652	203.1
2000	2622	220.3
2001	2550	186.1
2002	2574	171.7
2003	2599	181.7
2004	2554	183.5
2005	2409	174.6
2006	2394	154.9
2007	2443	148.3
2008	2342	163.7
2009	2462	144.1

INNER COVER

Since 1999, according to the USDA National Agricultural Statistics Service, the U.S. has lost 3.02% of its farmland . . . that is, in 1999 we had 948.5 million acres of farmland, and in 2009 that had dropped to 919.8 million acres. On the surface that sounds fairly benign, right?

But our population in 1999 was 271.5 million people, so each and every person, then, had 3.5 acres of farmland all their own. Think what you could do with 3.5 acres. Today, however, with 308.7 million people, our individual piece of turf has shrunk to only 3.0 acres per person. Everybody here has lost a half acre, somewhere.

But look at it like this. If your backyard is an acre (43,560 square feet), and you lost 3.02% over the last 10 years, that would total 1,306.8 square feet, or a square chunk 36 feet on a side. Since a square acre is 208 feet on a side, 36 feet, over 10 years isn't much . . . that comes to just over a yard a year. Hardly noticeable, right?

The big picture, however, is a little more daunting. That 3.02% represents 28,700,000 acres of farm land that is no longer farm land. Where did it go?

Well, mostly to make room for 37.2 million people who weren't here 10 years ago to be, and to make places for them to go . . . to shop, to recreate, to drive on and to put their stuff.

28.7 million acres over 10 years comes to a pittance in our overall land mass though. Why, it's only 7,863 acres a day, every day, seven days a week, 52 weeks a year, bulldozed, graded, smoothed, lawned, roaded and built on.

Or, you could look at it this way. In the last 10 years we've taken all the *farm land*, every square inch of it, from Alabama, Connecticut, Delaware, Massachusetts, New Hampshire, North Carolina and Pennsylvania. All of them combined, all gone.

Not impressed with the agriculture in those little eastern states?

What about all the *farm land* in Florida, Kentucky and Nevada? All of it. Or, what about California, Alaska (just the farmland, not the oil land), Hawaii and New Jersey. California alone should give you pause.

Bigger? How about all the *farm land* there is in Missouri, except maybe the bootheel? That'll show 'em.

But if you want the real picture, one easier to visualize, that 28.7 *million* acres converts to 44.8 *thousand* square miles. Miles. Know how big that is? The whole state of Pennsylvania is 44.8 thousand square miles, that's how big. Not just the farm land, the whole entire state. Every city, country road, farmyard, golf course and airport. Everything. And just think. It only took 10 years.

•

The unofficial count was just about a thousand. Just about a thousand people from 12 states attended the one-day Beekeeping meeting held in Wooster, Ohio, sponsored by The Ohio State University Bee Lab, and the Tri-County Beekeeper's Association. Jim Tew, one of our regular columnists, heads up that lab, and Sherry Ferrell, his right hand Assistant, keeps him on his toes, and keeps the meeting planning on time every year.

The Tri-County Beekeepers do much of the planning and volunteer for all the work that needs done long before, during, and after the big day...and there is lots to do. Road signs are all over the place outside of Wooster pointing the way to the meeting. A program book and registration pack are assembled, with name tags and hand outs and an evaluation form, tablet paper and pencil. A huge door prize program has names being drawn all day long, plus there's a raffle of some expensive equipment at the end of the day. There's a hot, sit-down meal, and box lunches available, and a host of vendors attending. There's a kids-program, an all-day beginner's class, dozens of workshops, plus a main speaker who gives the "big" talk at the beginning of the day. Every room has a moderator and a host, and there are volunteers everywhere helping in the kitchen, the vendors, with the coffee and meals and tables and chairs.

The cost is minimal for this much education, opportunity and entertainment, and after a winter such as we have had in Northeast Ohio this year, no price would have been too high to get out and talk bees and beekeeping with hundreds of other like-minded folks. It was a day to enjoy, to experience and to gain from...and with as many people as possible.

The Governor's wife came this year to offer support to Ohio's beekeeping community. She's on a mission to expand beekeeping in Ohio to increase job opportunities, to increase Ohio's honey production and to increase the pollination potential for the plants that provide food and shelter for our wildlife. We're glad she's on our side.

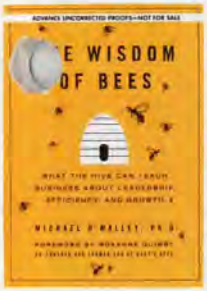
The Ohio State Beekeepers have a Legislative Task Force formed that is working with the state legislature to gain additional support for beekeeping over the minimal support offered now, and, perhaps, to reinstate some of the inspection program that's been gutted in the past few years. Legisla-

Continued on Page 78

7,863 Acres
A Day.

Welcoming
Spring.

New For Beekeepers



The Wisdom Of Bees. What the Hive Can Teach Business About Leadership, Efficiency and Growth. By Michael O'Malley. ISBN 9781591843269. 220 pages. Hard cover. $21.95.

The author is a social psychologist and management consultant, and is executive editor for business, economics and law at Yale Univ. Press, and an adjunct professor at Columbia Business School. He's been keeping bees since 2002.

What he has done in this book is marry the lessons of survival and growth that are accomplished in a beehive to the requirements of running a successful business. He uses bee behavior to show businesses how to improve their relationships with employees, customers and each other. From this he has derived 25 lessons . . . Protect the future, Keep energy levels up, Stay in Touch, Keep it Simple, Preserve a Positive Workplace, Bring in New Blood for New Life . . . you can see the ties of business and beehives here I think.

As a business book, I enjoyed, and learned from this . . . as a beekeeper, well, the analogy was interesting, and the resources were broad and deep, but even in the author's intro he states that sometimes he had to pull back on the bee stuff and concentrate on the business stuff. The business stuff is good though – and worth getting the book for.

Roxanne Quimby, the co-founder and former CEO of Burt's Bees wrote the Foreword and labeled it charming, humorous and above all, unforgettably informative. I agree.

Mellifera Millinery – Custom Couture beekeeping Hats and Veils©.

Bobbie Myzen of Honey Bee Farm in Redding CT has created Mellifera Millinery for the stylish beekeeper. The hats are available in two styles – Traditional straw pith helmet or straw garden hat. Veils are dark tulle netting.

Silk flowers, of poppies, roses, sunflowers, hydrangeas, dahlias, along with beautiful ribbons are available made to each order's specification. Look for sample designs at www.HoneyBeeFarm.org. Photos are available for approval prior to shipping. $75.00 plus shipping. Call 203.948.3529 for info.

Beezerkbelts introduces two new products. First, the RobStopper mesh hive cover. It effectively stops robbing during hive inspection, and has simple and secure attachment. Also use it to protect stacked honey supers while working in the yard or while transporting them to the honey house.

The RobStopper is sized to slip over even the polystyrene hive boxes. Made in the U.S. of durable nylon mesh that is washable, and it is mold and mildew resistant.

Sue Garing is a retired engineer living in Kirkwood, NY. She is working with fellow NY beekeeper Bob Talkiewica, whose background includes design and marketing of high quality backpacking equipment.

The **Beekeeper's Tool Belt** has pockets to hold a queen marker, pen, marker, scissors and a queen cage. The primary feature is a robust magnetic holder that fits any style hive tool. No more looking in the grass or trying to remember where you laid your hive tool last.

Hive tools become too sticky to easily slide into a holster type tool holder. The magnets quickly and securely hold your hive tool.

Made in the U.S., the lightweight, washable tool belt is built with quality materials often used in backpack construction. The fabric is 420 denier nylon pack cloth, known for durability, abrasion resistance, and being mold and mildew resistant. The adjustable 48 inch belt is long enough to go over your beesuit and sweater when working in cool weather. Note that the quick release buckle has breaking strength over 200 pounds.

The Beezerkbelts Tool Belt is patent applied for. All Beezerkbelts products carry a limited lifetime warranty covering defects in materials and workmanship.

Go to **www.beezerkbelts.com** or **sgaring @verizon.net**.

The Quest For The Perfect Hive. A History Of Innovation in Bee Culture. By Gene Kritsky. 5.5" x 8.5". B & W. 200 pages. Hard cover. Oxford University Press. ISBN 9780195385441. $24.95.

From ancient Egypt to forest beekeepers to skeps and their niches, box hives and barrels, glass jars and the Crystal Palace Exhibition in London . . . to top bars and frames and the documentation of bee space . . . all about Langstroth and his hive and his problems, to those who wouldn't or couldn't change to all sorts of frames that were used . . . Dr. Kritsky covers it all in this profusely illustrated, easy to read book. But he doesn't stop there. He looks in detail at the history of bee houses and bee calendars and protective gear and smokers and extractors.

He does a thorough job looking at the evolution of the modern hive from skep to Langstroth style, studying the dead ends the wrong turns, and does the same with the evolution of the top bar hive . . . wrong turns and dead ends included.

The bibliography is extensive, and useful for anyone holding a similar quest in this historical chase.

In my opinion, anyone remotely interested in the history of beekeeping should have this book so they are familiar with the history of the equipment we use everyday. I guarantee you will more fully appreciate the ease of honey bee management every time you open a hive.

Dr. Kritsky is Professor of Biology at the College of Mount St. Joseph in Cincinnati, and Adjunct Curator of Entomology at the Cincinnati Museum Center. He also serves as Editor-In-Chief of American Entomologist, the magazine of the Entomological Society of America.

APRIL – REGIONAL HONEY PRICE REPORT

Again this year we polled our reporters on where they sell their honey. We've been doing this for several years, and the pattern if fairly predictable. Our reporters are primarily sidleline a very small commercial beekeepers, with a few larger outfits represented that tend to be producer/packers.

If you are interested in expanding your honey (and other hive product) sales, look over this list of possible outlets. There are most likely some you are missing now and could investigate. Price is not the key to more sales so don't undersell your product. Rather, increase your exposure by increasing where your honey is sold.

Home sales continue to dominate the scene…both outside honey stand sales and inside sales. If you are just starting out, remember that if you are selling honey from home, your insurance may need tweaking since you are operating a business there. More businesses are requiring beekeepers to have some sort of liability insurance if they wish to sell honey at that outlet. Businesses don't want your problems to become their problems.

The outstanding category this year is the increase in sales at gift stores…local honey is a great gift for tourists. And one our reporters mentioned truck stops as good outlets because drivers are being encouraged to eat better…and honey is better than sugar.

Where Do They Sell Their Honey?

% of Reporters Selling at these locations						% of Their Honey Sales at these locations						Locations Honey Sold at
2005	2006	2007	2008	2009	2010	2005	2006	2007	2008	2009	2010	
78	69	65	76	82	81	35	33	46	44	40	43	Home (inside or roadside stand)
14	13	16	16	20	13	41	49	26	37	34	14	Local community - sponsored farm market (i.e. Sat. & Sun. sales)
21	30	37	16	26	23	14	17	32	32	26	27	Local Farm Market business that's seasonal (Fall only, for instance)
18	16	18	18	26	32	34	17	25	39	36	38	Local Farm Market business that's year-round
6	18	5	10	8	9	23	5	44	30	29	34	Flea Market
41	28	24	34	39	37	14	20	19	20	26	19	Health Food/Organic store
17	10	10	13	11	8	9	7	14	5	11	37	Gift Store
29	23	15	14	20	19	16	16	25	25	16	22	Bakeries/Food Establishments
11	5	4	9	15	13	23	5	21	19	15	13	Local High-End Retail Outlets (gourmet stores)
25	36	21	24	37	37	18	19	19	19	16	19	Local, Small 'Mom & Pop' Retail Outlets (grocery & gas)
25	10	9	11	16	13	31	12	32	48	30	26	Local Small Packer or Producer/Packer
10	5	5	6	3	0	68	45	60	54	63	0	Huge Packer, they pick up
6	3	3	6	8	9	29	40	47	33	42	30	Wholesale only to larger stores, you deliver to warehouse
10	10	6	10	13	11	3	15	5	7	6	3	Breweries/Beer or Mead makers
11	8	7	6	10	4	12	15	17	29	8	8	Internet, direct retail, mail order
11	25	18	26	22	17	6	28	33	23	15	11	Work, direct retail
6	8	5	6	8	8	33	17	18	7	8	25	Local/State Fair, with club

*Total percentage of sales does not come out to 100% because of multiple outlets.

REPORTING REGIONS													SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS													Range	Avg.		
55 Gal. Drum, Light	1.67	1.65	1.63	1.53	1.53	1.65	1.65	1.67	1.62	1.55	1.63	1.55	1.53-1.67	1.61	1.54	1.49
55 Gal. Drum, Ambr	1.49	1.55	1.49	1.45	1.45	1.45	1.53	1.49	1.49	1.49	1.36	1.43	1.36-1.55	1.47	1.45	1.38
60# Light (retail)	130.00	138.00	130.00	130.25	120.00	142.50	135.43	141.67	136.39	136.39	135.00	143.00	120.00-143.00	134.89	131.75	124.25
60# Amber (retail)	130.00	128.33	130.00	108.00	120.00	133.33	127.83	145.00	117.50	107.50	128.25	157.50	107.50-157.50	127.77	127.09	121.85
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	55.20	61.98	44.40	53.25	65.82	54.00	44.28	65.82	65.82	45.36	44.40	85.87	44.28-85.87	57.18	58.74	54.39
1# 24/case	67.56	79.78	74.40	70.14	76.00	83.60	77.13	73.20	72.00	97.44	64.95	97.40	64.95-97.44	77.80	81.01	73.31
2# 12/case	73.80	68.05	66.90	62.73	69.00	66.30	70.08	81.00	57.50	75.00	51.10	83.00	51.10-83.00	68.71	68.15	64.59
12.oz. Plas. 24/cs	68.16	74.98	59.00	63.64	60.00	66.00	58.30	64.60	60.00	56.40	64.30	68.90	56.40-74.98	63.69	64.20	58.63
5# 6/case	78.81	96.99	77.40	76.30	82.15	90.00	74.90	80.40	72.00	70.20	65.50	89.67	65.50-96.99	79.53	75.82	73.97
Quarts 12/case	82.81	110.88	86.00	103.92	96.00	84.33	94.95	96.00	120.00	84.02	72.85	117.00	72.85-120.00	95.73	108.70	96.13
Pints 12/case	59.48	56.95	112.20	58.70	60.00	55.00	90.60	58.20	84.00	59.16	52.50	67.67	52.50-112.20	67.87	64.65	59.42
RETAIL SHELF PRICES																
1/2#	3.00	3.21	2.37	3.37	2.29	3.00	2.93	1.79	2.99	2.75	2.81	5.25	1.79-5.25	2.98	2.97	2.88
12 oz. Plastic	3.50	3.95	2.98	3.91	3.49	3.68	3.57	3.82	4.02	2.50	3.86	4.33	2.50-4.33	3.63	3.85	3.57
1# Glass/Plastic	4.08	4.49	4.30	4.53	4.99	5.09	4.64	4.56	4.20	4.26	4.92	6.35	4.08-6.35	4.70	4.03	4.48
2# Glass/Plastic	7.75	7.75	7.11	7.38	8.15	8.17	8.16	8.90	7.26	7.13	7.34	10.19	7.11-10.19	7.94	8.06	7.69
Pint	6.84	6.32	6.50	6.41	6.32	5.46	6.85	6.56	7.50	7.12	5.85	8.66	5.46-8.66	6.70	8.69	6.75
Quart	12.70	9.48	11.00	10.78	10.45	9.34	10.46	11.50	11.00	12.80	11.00	14.50	9.34-14.50	11.25	11.63	10.58
5# Glass/Plastic	17.33	15.79	19.30	17.20	17.33	19.75	16.65	19.50	18.00	15.22	14.11	23.00	14.11-23.00	17.76	18.12	16.93
1# Cream	5.64	5.80	6.50	5.63	5.64	5.50	4.93	5.99	5.29	5.28	5.79	7.25	4.93-7.25	5.77	6.24	5.49
1# Cut Comb	5.82	5.71	6.50	4.60	5.82	5.83	6.43	5.99	5.82	7.50	6.00	8.50	4.60-8.50	6.21	6.76	7.07
Ross Round	6.50	4.65	6.50	5.45	5.74	6.50	6.00	6.50	5.74	5.25	6.67	10.99	4.65-10.99	6.37	6.77	6.49
Wholesale Wax (Lt)	1.50	3.92	2.50	3.11	2.15	4.00	3.75	4.00	3.25	4.18	3.07	3.50	1.50-4.18	3.24	3.68	3.77
Wholesale Wax (Dk)	1.50	3.48	2.50	8.14	2.00	5.00	3.67	4.00	3.57	3.57	2.68	3.50	1.50-8.14	3.63	2.81	3.08
Pollination Fee/Col.	90.00	88.33	70.00	46.50	150.00	66.67	53.60	62.50	88.45	88.45	50.00	111.00	46.50-150.00	80.46	79.91	79.59

a closer look

BROOD PHEROMONE/ FORAGING BEHAVIOR

Clarence Collison
Audrey Sheridan

Brood pheromone clearly acts as a modulator of colony nutritional dynamics.

Foraging behavior and the mechanisms that regulate foraging activity are important components of the honey bee's social organization. The success of a colony is contingent upon its ability to forage for the materials necessary for colony development, maintenance, and survival. Colony survival is highly dependent on the hoarding instinct, the collection and storage of food. The type and quantity of forage collected is relative to colony needs, environmental conditions and available floral sources. One of the triggers for foraging behavior is brood pheromone. The amount of this chemical signal available to workers controls the onset and cessation of pollen foraging and determines where pollen is stored within the hive. Genetic predisposition to pollen foraging and a high sensitivity to sucrose also contribute to bees performing this specialized task.

Worker honey bees become field bees when they are two to three weeks old (Winston 1987). At that time, they tend to either specialize in collecting pollen or nectar on single foraging trips, or they become generalists and collect both (Fewell and Page 1993). Free (1967) found that individual bees quickly changed from collecting nectar to collecting pollen and vice versa, according to their colony's needs. The proportion of foragers that collected pollen increased when more brood was present, as did the amount of pollen collected. Bees from colonies deprived of brood foraged less, and many former pollen-gatherers from these colonies switched to collecting nectar only. Free (1967) also observed that brood odor and contact with bees tending the brood were each partly responsible for signaling foragers to collect pollen, but access to the brood was the most important factor. Although brood of all stages stimulated pollen collection, in some circumstances larvae were more effective than pupae. The absence of a queen, with or without brood, increased nectar collection and decreased pollen collection, but did not affect the overall number of foragers. Giving pollen to a colony decreased its pollen collection and increased nectar collection, but giving carbohydrates did not influence foraging behavior.

"The number of pollen foragers in a colony depends on the amount of larvae (brood) present at a given time, the quantity of stored pollen in the colony, individual forager genotype and available environmental resources."

The number of pollen foragers in a colony depends on the amount of larvae (brood) present at a given time, the quantity of stored pollen in the colony, individual forager genotype and available environmental resources (Pankiw et al. 1998). When pollen is artificially added to a colony, pollen foraging activity decreases until the excess pollen has been depleted through consumption. The quantity of stored pollen then returns to previous levels. When pollen is removed from a colony, the number of pollen foragers, their trip frequencies and their pollen load sizes increase until the amount of stored pollen is restored to the previous balance.

To clarify how pollen foragers gauge the supply of pollen in their hive, individual foragers returning

with pollen were followed within four-frame observation hives (Dreller and Tarpy 2000). Pollen foragers deposited their loads on the frame where the most unsealed brood was located; this was done irrespective of the position of this frame within the hive. Foragers also inspected more cells on that frame, and spent most of their time there, indicating that they may individually evaluate the pollen requirements of the colony. In 18 normal-sized colonies the effects of olfactory cues on foraging were compared between colonies provided with a frame of hungry young brood or an additional pollen frame covered by cages. This experiment showed that olfactory stimulation within the colony is insufficient to increase or decrease the foraging effort, but suggests that foragers must have direct contact with the brood and pollen area to regulate their foraging activity according to the conditions in the colony.

Fewell and Winston (1992) examined interactions between individual foraging behavior and pollen storage levels. Colonies responded to low pollen storage conditions by increasing pollen intake rates, relative to high pollen storage conditions, by 54%. This demonstrated a direct relationship between pollen storage levels and foraging effort.

Approximately 80% of the difference in pollen intake rates was accounted for by variation in individual foraging effort, via changes in foraging activity and individual pollen load size. An additional 20% resulted from changes in the proportion of the foraging population collecting pollen. Under both high and low pollen storage treatments, colonies returned pollen storage levels to pre-experimental levels within 16 days. It is evident from these results that honey bees regulate pollen storage levels around a homeostatic set point.

The presence of young larvae also affects the proportion of foragers collecting pollen: more young larvae results in more pollen foraging. This behavioral response has been shown to be related to brood pheromone. Brood pheromone is composed of fatty acid esters, which are extractable from the surface of honey bee larvae. Pankiw et al. (1998) demonstrated that hexane extracts of two- to four-day-old larvae containing brood pheromone stimulated foraging. Colonies were provided with extracts of 1,000 larvae (brood pheromone), 1,000 live larvae (brood), or no brood or pheromone. Colonies with brood pheromone and live brood had similar numbers of pollen foragers, while colonies without live brood or pheromone had significantly fewer pollen foragers. The number of pollen foragers increased more than 2.5-fold when colonies were provided with extracts of 2,000 larvae as a supplement to the 1,000 larvae they already had. Within one hour of presenting colonies with brood pheromone, pollen foragers responded to the stimulus. The results from this study demonstrate some important aspects of pollen foraging in honey bee colonies: 1) pollen foragers appear to be directly affected by brood pheromone; 2) pollen foraging can be stimulated with brood pheromone in colonies provided with pollen but no larvae; 3) pollen forager numbers increase with the addition of brood pheromone even when the number of larvae in the colony does not increase.

"Bees with low sucrose thresholds (responding to a low concentration of sucrose) are more likely to be pollen foragers; bees with high sucrose thresholds (responding to a high concentration of sucrose) are more likely to forage for nectar."

Some of the determining factors for foraging behavior are intrinsic. For example, there is a neuro-sensory component of foraging behavior which can be observed in the proboscis extension response (PER) threshold of bees to sucrose. Individual bees within a colony population differ in their response thresholds to the food stimuli (pollen and nectar) associated with foraging and recruitment decisions. Once the intensity of a task-related stimulus exceeds an individual's response threshold, that bee starts performing the associated task (Scheiner et al. 2004). Subgroups of a honey bee colony engaging in a certain task will therefore have a similar response threshold for the stimulus associated with that task. This mechanism is clearly demonstrated in proboscis conditioning of worker bees to a gradient of sucrose solutions. Sucrose is an important stimulus for honey bee foraging behavior. Variation in responsiveness to sucrose solutions has been found to be related to foraging decisions and learning. The honey bee proboscis extension response has been identified as a "window" into a bee's perception of sugar. The sucrose response threshold measured in the first week of adult life, prior to foraging age, predicts forage choice. Bees with low sucrose thresholds (responding to a low concentration of sucrose) are more likely to be pollen foragers; bees with high sucrose thresholds (responding to a high concentration of sucrose) are more likely to forage for nectar. There is an associated genetic component to sucrose response thresholds and forage choice, such that bees selected to hoard high quantities of pollen have low response thresholds and bees selected to hoard low quantities of pollen have higher response thresholds.

In Pankiw and Page (1999), bees derived from artificially selected high and low pollen-hoarding strains were tested for their proboscis extension response to water and various sucrose concentrations. High-strain bees had a lower response threshold to sucrose than low-strain bees among pre-foragers, foragers, queens and drones. Pre-foraging low-strain workers showed ontogenetic changes in their response threshold to sucrose, which was inversely related to age. High-strain foragers were more likely to return with loads of water than low-strain foragers; low-strain foragers were more likely to return with loads of nectar. Low-strain nectar foragers collected nectar of significantly higher sucrose concentrations than did the high-strain nectar foragers. Alternatively, low-strain foragers were more likely to return empty than high-strain foragers.

Pankiw and Page (2001) tested the hypothesis that brood pheromone decreases the sucrose response threshold of bees to suggest a pheromone-modulated, sensory-physiological mechanism for regulating foraging division of labor. A synthetic blend of honey bee brood pheromone, applied to glass

plates suspended in the hive, stimulated pollen foraging in foraging bioassays. In proboscis extension assays, synthetic brood pheromone was applied to glass plates and suspended in cages of bees, significantly decreased sucrose response thresholds in a dose-dependent manner. Their results suggest that brood pheromone may prime bees into a particular foraging role by decreasing response thresholds at a young age. Response thresholds naturally decrease with age (Pankiw and Page 1999). When a bee begins to forage, her response threshold to sucrose correlates with her probability of collecting pollen (Pankiw and Page 1999), and the sugar concentration of nectar she finds suitable to collect (Pankiw and Page 2000).

Pankiw et al. (1998) found no effects of brood or brood pheromone extracts on sucrose-foraging behavior. Yet, the dramatic increase observed for pollen foraging with supplemental brood pheromone suggests that the colony contains a pool of potential pollen foragers that are not actively foraging. They are not activated until the pollen-foraging stimulus exceeds their response thresholds for brood pheromone.

LeConte et al. (2001) quantified a dose effect of synthetic brood pheromone on colony foraging behavior. They treated colonies with the 10-component blend of synthetic brood pheromone (BP), and found that hives treated with 6,200 larval equivalents (LEq) of synthetic brood pheromone showed delay in worker foraging when compared with broodless, untreated colonies. As part of the same study, some colonies were treated with a "low dose" of BP (620 LEq) and some with a "high dose" (6,200 LEq). Bees reared in colonies with low doses of BP foraged at significantly younger ages than bees reared with high doses.

Pankiw et al. (2008) demonstrated that brood pheromone may be used as a tool to stimulate colony growth in the southern subtropical areas of the United States (College Station, TX); this is where the package bee industry is centered and a large proportion of migratory colonies are overwintered. Results showed that brood pheromone significantly increased the rate of colony growth in the spring and summer when flowering plant pollen is available in the foraging environment. Increased colony growth rate occurs as a consequence of increased pollen intake resulting from greater recruitment of pollen foragers and heavier weights of returned pollen loads. The hypothesis that was tested claimed that the addition of brood pheromone during the winter pollen dearth in a humid, subtropical climate increases the rate of colony growth in colonies provisioned with a protein supplement. Experiments were conducted in late Winter (9 February–9 March 2004) and mid-Winter (19 January–8 February 2005). In both years, increases in brood area, number of bees, and amount of protein supplement consumption were significantly greater in colonies receiving daily treatments of brood pheromone versus control colonies.

Research has demonstrated that brood pheromone has at least three effects on worker bees, regarding foraging behavior: 1) initiation of pollen foraging behavior; 2) modulation of the neuro-sensory response to sucrose; 3) acceleration or delay of the onset of foraging, depending on the amount of brood pheromone received by bees (Pankiw 2004). Beekeepers often provide a protein/pollen supplement to colonies during periods of low pollen availability to stimulate colony growth. However, because larvae may be absent or at their lowest levels in the Winter or early Spring (Winston 1987), there is very little if any larval stimulus to induce consumption of protein supplements. Additionally, low to no brood pheromone results in low or no hypopharyngeal gland development or protein biosynthesis in adult bees (Mohammedi et al. 1996). Brood pheromone clearly acts as a modulator of colony nutritional dynamics, and the synthetic compound may be used to enhance the protein intake of an overwintering colony. BC

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TASTE OF TUPELO

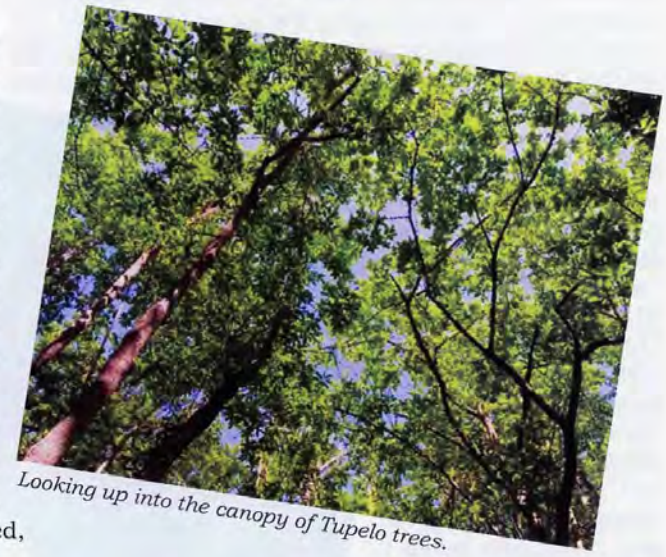
Certified Pure Tupelo Honey has truly earned the title Liquid Gold – just ask Ulee

Hazel **Freeman**

Thousands of blossoms cover the Tupelo trees when they're in bloom.

Captain Larry Covell, of Wheelhouse Adventure Tours, eased the throttle forward on his 28-foot high performance landing craft, Pegasus. The twin 115 Yamahas easily brought the craft up onto a plane. As we picked up speed, I watched Captain Covell throw a furtive glance back over his shoulder at the brooding sky behind us. We were being chased by a band of dark, rumbling thunderheads heading our way as they churned up the Florida sky.

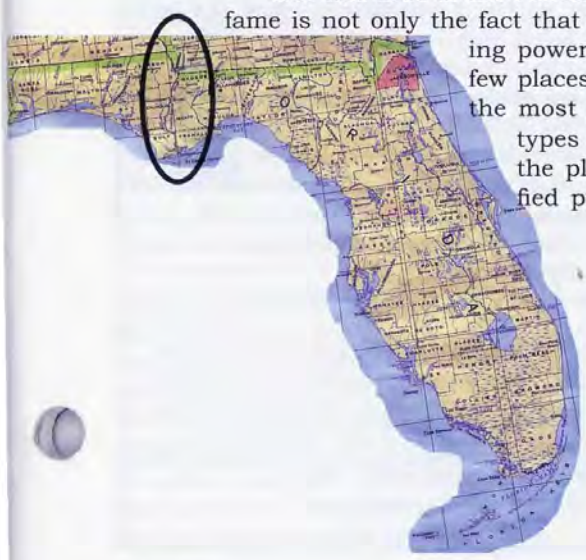
The captain was making a mad dash back towards the Marina in Apalachicola from where we'd set out earlier in the day. We had leisurely cruised through salt marsh channels and meandered our way through murky backwaters and bayous passing remote floating fishing shanties. It was a beautiful, yet eerie, place where bulrush, bald cypress, and tupelo trees were King. It's a place that looked as though if you wandered too far off the beaten path, you'd simply be swallowed up by the swamp; never to be seen again. It was a place where snakes slithered, gators lurked, and mosquitoes were out for blood.



Looking up into the canopy of Tupelo trees.

Our wanderings that afternoon had taken us into one of the most productive estuaries in the northern hemisphere; the Apalachicola Bay area. It is a nursery so prolific that 95% of all species harvested commercially in the Gulf of Mexico spend a portion of their life in estuarine waters. The Apalachicola River, dumping about 15,000 cubic feet per second of fresh water daily into the bay, pushes oxygen and nutrients out into the Gulf waters, feeding its hungry inhabitants.

Florida has thousands of acres of Tupelo swamp.



But this area of the Florida Panhandle's claim to fame is not only the fact that it's a seafood producing powerhouse, it's also one of few places on earth where one of the most prized, and delectable, types of monofloral honey on the planet is produced. Certified pure tupelo honey, when meticulously produced by the few remaining dedicated, specialty tupelo beekeepers, is a true varietal honey. It has earned the title of "liquid gold," and truly deserves it.

As a hobby beekeeper in Ohio, I'm interested in all things "bees." I remain enamored and filled with a sense of wonder each time I see a bee visiting a flower and wearing a dusting of yellow pollen. I watch in amazement at the comings and goings at the hive entrance. When I delve into a hive and see all that goes on deep inside while shrouded

in total darkness, I'm in awe. With each and every spoonful of delightful honey my taste buds rejoice at the shear perfection of this food.

I've come to the conclusion that no matter how much I learn about bees, I'll never learn enough. So it was with the "tupelo." I had never tasted tupelo honey. I'd been too involved in my own little beekeeping world. I knew nothing about the white tupelo tree, (*Nyssa ogeche*), where it grows, or when it blooms. I was ignorant of the fact that to produce this rare and unique honey is really an art, and hardworking beekeepers such as Ben Lanier, Don Smiley, Jim Rish, and George Watkins, who manage their bees in the Florida panhandle, are the skilled artists.

I didn't know that if pure enough, tupelo honey remains a flowing, golden liquid from the first delicious drop to the last, and doesn't crystallize, as do other honeys over time. And, I'm sorry, Peter Fonda, but up until my tupelo quest began, I had never seen the movie Ulee's Gold. So when the opportunity came knocking to travel into the heart of tupelo country I knew I had to go. I had to have "a taste of tupelo."

The Ogeche (Ogeechee), or white tupelo tree, grows in a greater concentration in the Apalachicola River region in the northwest portion of the Florida panhandle than anywhere in the world. White tupelo trees can be found in other Gulf Coast states, but only the dense stands of trees in this part of Florida make it possible for beekeepers to isolate their bees among the tupelo during the short bloom time. It is this monofloral isolation that produces some of the world's most rare and highly prized, certified tupelo honey.

How this native of China came to the United States is not exactly known. The most popular legend tells of a Baptist missionary who had returned from the Far East with a cache of seeds in her purse. During her travels down the Apalachicola River by barge, her purse was stolen and the seeds thrown into the river. However, the tupelo arrived, it now reigns over thousands of acres of Florida wetlands.

Similar to Cypress, tupelo trees prefer wet feet and thrive along the rivers and swampy bayous and backwaters that flourish in this area of Florida. Growing to a height of 50 to 75 feet, and a diameter of 2 to 3 feet, a single white tupelo can produce thousands and thousands of sweet, nectar filled blossoms. The short tupelo season, usually lasting only a few weeks, (some years only days), from April into May, means every minute counts for beekeepers who rely on the tupelo harvest to see them through the entire year financially.

In Florida, less than ten plant species account for over ninety percent of the honey crop. The state's abundant citrus crops provide the only cultivated nectar source. Few locations support bees throughout the year and most beekeepers move their hives two to three times a year to produce a honey crop. Moving colonies from one honey flow to another was practiced by Florida beekeepers long before it became a common practice in the beekeeping world.

Early tupelo beekeepers had no roads to reach the prime tupelo locations. Hives were loaded onto boats and barges, and beekeepers braved the backwaters and bayous to transport their precious cargo along watery highways deep into the dangerous swamps. High ground was another rare commodity amid the swampy landscape. Wooden platforms were often built out in the rivers on stilts and hives were stacked on these precarious stanchions during the height of the tupelo flow.

Only one beekeeper, George Watkins, continues the labor-intensive practice of moving bees by barge up the Apalachicola River to reap the rewards of the rich tupelo flow. Watkins loads his bees onto a homemade barge and transports the colonies some fifteen or so miles up-river. Watkins bees forage in some of the densest groves of tupelo available in the panhandle.

The sweet tupelo nectar has chemical properties that make it differ from other honey. Like most sweets, honey usually has a high sucrose versus fructose content. Pure tupelo's sugar make-up is just the opposite with sucrose registering a very low percentage. This reversal of sugar concentration is the reason pure tupelo resists granulation.

But how is pure certified tupelo sorted out from a run-of-the-mill tupelo. By microscopic pollen analysis. Honey samples are sent to the Florida Department of Agriculture's Food Laboratory in Tallahassee for testing. Tupelo pollen's distinctive shape makes it possible to count the pollen grains. To be labeled tupelo only requires a 50% pollen count. Specialty tupelo producers like Don Smiley of Wewahitchka (Wewa), pride themselves on their high pollen counts, which often register around 95%. "I pull a sample every ten drums to send off for analysis," says Smiley. "My tupelo this year would probably have registered about 99% if I had used completely new comb." Though each year is different, Smiley has been happy with the last two years of his tupelo honey harvest.

What is a good year in tupelo terms? The nectar flow lasts four weeks, the water level in the rivers stay high, but not too high, the weather remains good with cool nights and warm days that are neither too hot nor humid. Something as simple as heavy rains and high wind during peek bloom time can destroy the delicate blossoms and ruin or shorten the tupelo flow. Too much rain can flood bee yards, cut off access to the hives, or even worse, drown the bees. It's not unusual for beekeepers to have

Don Smiley inspects some of his bees in one of his beeyards.

Tupelo chunk comb honey.

to scramble to empty bee yards due to rising water, losing out on precious tupelo time while the hives are away from their prime locations.

Timing is everything when you're talking tupelo. By mid April, experienced beekeepers are checking the tupelo buds daily trying to gage the exact day the blossoms will open. Only when the first round buds spread their tiny tendrils and release their sweet nectar can the beekeepers begin the hurried and daunting task of removing and extracting hundreds of honey supers filled with mixed floral honey. Bees not already in the tupelo yards must be moved and given empty supers as soon after the tupelo begins to bloom as possible. Any delay means less honey and a loss of revenue for the beekeepers.

Once the flow begins, every minute of every day counts. "During a good tupelo flow, under perfect conditions, the bees can fill a super in one day," says Smiley. From dawn to well after dark, and often into the night, bee yards are tended, honey is extracted, barrels and bottles are filled, labels are placed, and orders delivered. Days are long and working the bees is a hot, sweltering task. Due to the heat, few beekeepers wear a complete bee suit, preferring instead only a veil, long sleeved shirt and gloves. Some even prefer to suffer stings rather than the smothering heat of long sleeves.

Smiley can tell just by listening to the hum deep in the swamp, and watching as the bees land, heavy, and low with their tails dragging, onto the bottom boards, when the flow is at its height. When it comes to an end, once again beekeepers rush to get the tupelo-laden supers removed to keep them as pure as possible. Bees then must be moved to new forage, to keep them strong.

The overall process is a labor of love with only a few die-hard beekeepers willing to carry on this rich, sweet Florida tradition. Some families like the Laniers and the Rishes have been tending their tupelo yards for generations while others like Smiley and Watkins have twenty or so years experience under their belts. It's the tupelo that keeps them going. Without it, they couldn't compete with the flood of foreign imported honey. The old-timers wonder if there will be new beekeepers to take their place when they're too tired and worn out to carry on.

As the tupelo season winds down, the Summer heat becomes unbearable. Some question whether it's worth all the work, but the "tupelo" is in their blood. Although exhaustion may make them question the amount of work involved, the lure of the honey bee and her amazing contribution to mankind past, present, and into the future, are never questioned.

As my quest comes to an end, I find myself standing in Don Smiley's honey house in "Wewa," surrounded by hundreds of supers filled with the precious tupelo harvest. With each step, my shoes snap and crackle as they stick to the floor. Pages of my tattered notebook, too, are stuck together. I watch as Smiley places frame after frame onto the uncapper. Each glowing frame is a beautiful piece of artwork designed by nature and drawn to completion by the bees. As the creamy white caps are sheared from each frame the greenish, golden tupelo drips into the vat below. Smiley scoops up a cup of cappings drenched in the liquid gold honey, "Here," he says, "Have a taste of tupelo." BC

EUREKA!

Appreciating Langstroth

On The Streets Of Philadelphia

Marc Hoffman

L. L. Langstroth about the time he invented his hive.

Return to Philadelphia

To celebrate Lorenzo L. Langstroth's bicentennial year, we are reviewing his life and contributions. In my previous article[4] I gave a brief summary of his life, and then, in greater detail, described some of Lorenzo Langstroth's origins, his early life, his marriage to Anne Tucker, and his life in Greenfield, Massachusetts until 1848.[5] Now I continue the story through 1853, including his invention and patenting of the practical movable frame beehive.

In 1848 the Rev. Langstroth was living in Greenfield.[6] He had moved there in 1840 to become principal of the High School for Young Ladies in the beautiful Coleman-Hollister House. The Hollister House at that time had several additional wings and outbuildings, added after its construction in 1796, and since removed. During his time as principal he "supplied the pulpit"[7] of the church next door, the Second Congregational Church of Greenfield and, in 1843, he became its regular pastor.

Throughout his adult life LLL suffered from periods of severe headaches and depression. His "head troubles" returned in 1848, forcing him to resign, and in the middle of that year he returned to the city of his birth, Philadelphia, Pennsylvania.

An advertisement in a local newspaper, *The North American*, in June 1848 seeks students for the "Young Ladies Institute, Rev. L. L. Langstroth, Principal."[8] It was to open on the first Monday in September of that year "in one of those spacious edifices formerly known as "The Blight Houses" at Chestnut above Broad. We can see Langstroth's influence in its promotion of ". . . careful arrangements in respect to temperature, thorough ventilation and the most convenient seats and desks." Inquiries were to be made of Mssrs. Charnley and Whelan, two prominent businessmen.

LLL was concerned with ventilation, both in beekeeping and in human habitations, and acted as a consultant about the ventilation in buildings in Philadelphia.[9] Ventilation was considered important in preventing, or slowing the progression of *consumption*, now known to be tuberculosis. It is no wonder he was concerned: his sister and his wife's sister had already died of the disease. His wife and son were later to succumb to it.

The Blight Houses were probably the set of buildings[10] later known as Colonnade Row on Chestnut St. between 15th and 16th Streets, a location which is in fact "above Broad." Contemporary prints show large rectangular buildings with many windows fronted with porticos supported by Greek columns. John Haviland, the noted architect, designed the buildings and George Blight developed the property, which explains the unfortunate name.

LLL took a house at Chestnut and Schuylkill Streets and began to keep bees. The house had a second story verandah and attic rooms, which he made into his urban apiary.

Why Lorenzo?

What was LL Langstroth's first name?[1] How did he get it? Although there is a record of his name being Latinized as Laurentius, he used Lorenzo his whole life and there is no reason to suspect that this was not his accurate given name.[2] But where did this name come from? One might suspect that he has some Italian background, but extensive research has revealed none whatsoever.

There is no direct evidence that LLL was named for Lorenzo Dow, but there is no reason to doubt it. Lorenzo Dow was a prominent figure in the Second Great Awakening, the religious revival of the early 19th century. Lorenzo Dow was an itinerant preacher who attracted great crowds and great notoriety. Often disheveled, with long, dirty, wild hair and beard, he kept no possessions and would show up, often unannounced, preaching the gospel. He was married, however, and his wife, Peggy Dow, was a character in her own right.

Lorenzo became one of the most popular boy's names of the early 1800s.

[1]Thanks to Gary Sieling for this information.

[2]It appears that birth certificates were not yet in use.

[4]*Bee Culture*, Jan. 2010 p 20-24.

[5]In the journals of his day, he often signed his articles and letters LLL, and I will sometimes refer to him that way in this article.

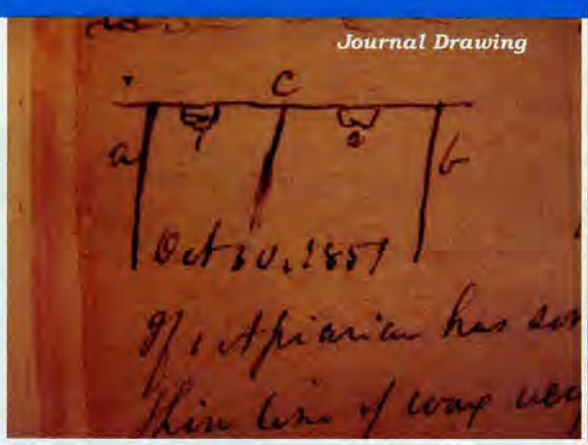
[6]Sources of information about Langstroth's life: Langstroth wrote a series of articles titled "Reminiscences," which appeared in *Gleanings in Bee Culture* magazine in 1892 and 1893. Florence Naile published her book *America's Master of Bee Culture, The Life of L. L. Langstroth* in 1942, reprinted in 1976. An 18 page biography written by Ophia Smith, "Langstroth, The 'Bee Man' Of Oxford" appeared in Vol. 57 of the journal *Ohio History*. Find it online by opening **www.ohiohistory.org** and searching for "Langstroth." I shall refer to *Gleanings*, to Reminiscences, to Naile, and to Smith in these footnotes.

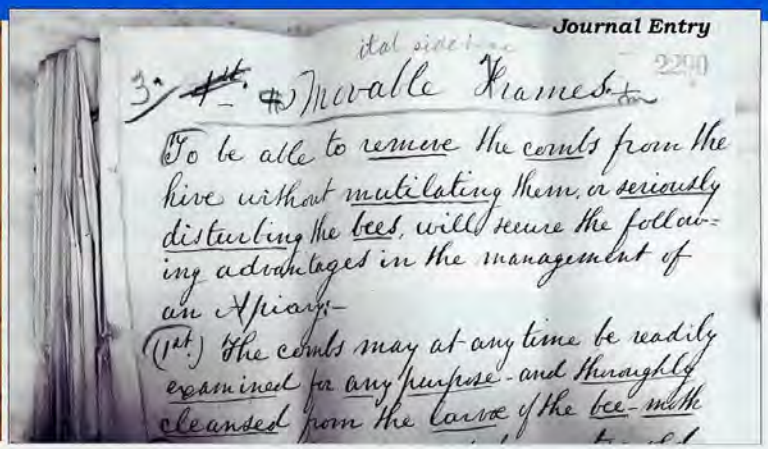
[7]That is, filling in while there is no permanent pastor.

[8]*North American*, June 28, 1848, page 4.

[9] *Barre Gazette*, September 12, 1851.

[10] See **http://dla.library.upenn.edu/dla/fisher/search.html?fq=digital_image:"Yes"+AND+image_resolution:"Low"&q=haviland** or see **http://search.brynmawr.edu/search?q=cache:n_Ve0xRTF-4J:www.brynmawr.edu/iconog/evans/files/plc009.html+colonnade&access=p&output=xml_no_dtd&ie=UTF-8&client=new_frontend&site=default_collection&proxystylesheet=new_frontend&oe=ISO-8859-1**


Journal Drawing


Journal Entry

Experimentation

In 1849 he set up an apiary in West Philadelphia, about two miles away. There he produced honey for sale and performed experiments.

LLL began using a leaf hive, or book hive, as described by Huber. Francois Huber (1750-1831) was a remarkable Swiss scientist. Blind, he learned through the observations of his wife, Marie Aimée Lullin and his servant, François Burnens. Langstroth was later to write that his wife, Anne, was to him as Huber's wife was to Huber. Huber's *Nouvelles Observations sur les Abeilles* was translated into English in 1806.[11] The leaf hive is a set of frames hinged together on one side so that the arrangement can open like a book. It was only valuable as an observation hive; LLL made several attempts to improve it so it could be used as a practical beehive, but was unsuccessful.

He also experimented with the Bevan hive, a top bar hive.[12] At that time the public was reasonably wary of extracted honey. Because of its purity, comb honey was more salable. A cover that had holes for the bees to pass through was placed on the top of the bars. Tumblers or jars could be inverted over the holes so that the bees would be able to draw and fill comb right in the jars.[13] In 1851, LLL won a first prize for his honey from the Philadelphia Horticultural Society.

The Bevan hive used rabbets[14] to recess the bars. The cover rested flat on the bars, in contact with them. The bees cement the cover to the top of the bars with propolis. To open the hive Langstroth had to cut the cover free of the propolis each time. He experimented and found that if he deepened the rabbet, and recessed the bars further, leaving 3/8 of an inch between the upper surface of the bars and the cover, the bees did not propilize the cover to the bars. The cover was easily removed without the necessity of cutting it free. LLL considered this a significant hive improvement and began writing a patent application for his improved hive.

In 1851 he became a member of the Academy of Natural Sciences in Philadelphia. One of the principles of the Academy since its founding in 1812 had been that religion was not to be discussed within the society, and therefore it was unusual for a clergyman to be elected to membership.[16] With Dr. Joseph Leidy, a noted Philadelphia pathologist and member of the Academy, he performed an experiment that confirmed Dzierzon's finding that the drone sperm was stored in a small spherical gland in the queen bee, the spermatheca. His report, "On the Impregnation of the Eggs of the Queen Bee." was published in February 1852.[17] He also presented a short discussion of honey ants to the Academy.[18]

An important channel of information for LLL, and an association with an important ally and supporter, began in 1851. An article appeared in the newspaper reporting that LLL had developed a method of raising bees in a glass hive in which they were content to work in full daylight.[19] Dr. Joseph Frederic Berg, pastor of the German Reformed Church in Philadelphia not far from LLL's house, read the account and paid him a visit. There he saw LLL's experiments, including hives with double glass walls. Pastor Berg told LLL about the work of Silesian scientist and Catholic priest Jan Dzierzon (1811-1906).[20] He also told him about Samuel Wagner of York, Pa. Wagner, a son of a pastor of the German Reformed Church, had grown up speaking German and was familiar with the beekeeping literature being published in Germany, which included two bee journals. He had translated some of Dzierzon's work into English. Wagner had, by that time, owned two newspapers, and would later found the "American Bee Journal."[21] It would be some time before the two would meet, but Wagner's encouragement would be critical to LLL's eventually writing "The Hive and the Honeybee."

Dzierzon had published, in 1845, a correct account that the honey bee drone develops from an unfertilized egg, a finding that remained contro-

[11]See the entry for Huber in ABC and XYZ of Bee Culture, 41st edition, 2006. I shall refer to this as ABC and XYZ.

[12]Top bar hives have movable slats. Each slat suspends a sheet of comb.

[13]See the illustration for patent 9300, in which the inner cover has just such an arrangement. **http://www.google.com/patents/about?id=6dRJAAAAEBAJ&dq=9300+langstroth**.

[14] A rabbet is a cut or groove along or near the edge of a piece of wood that allows another piece to fit into it to form a joint.

[16]Presentation of Barbara Ceiga, a Vice President of the Academy of Natural Sciences, Germantown, Pa. Jan 21 2010.

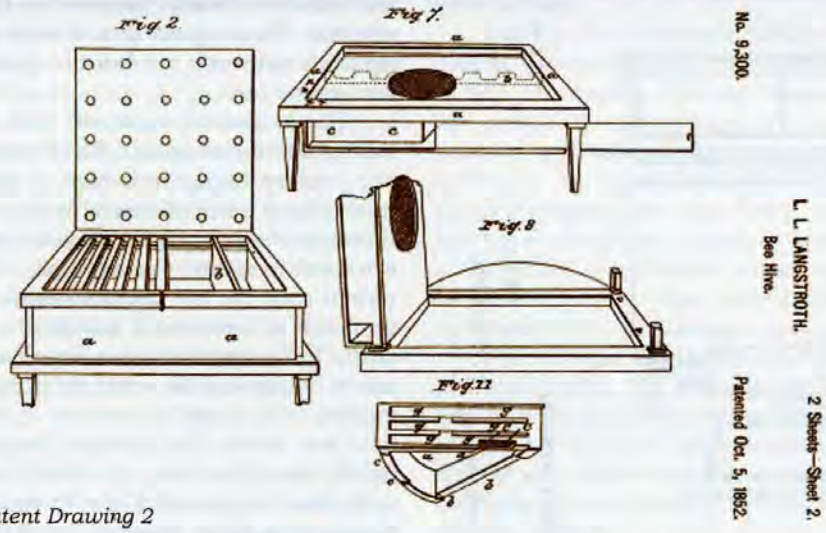
[17]Proceedings of the Academy of Natural Sciences (Philadelphia), Feb. 1852 p. 7. Available online from **http://www.jstor.org/stable/4058887**.

[18]Academy records show that he resigned his membership in 1893, two years before his death.

[19]See the *Barre Gazette*, September 12, 1851. This reports LLL's finding. It is not clear that this is the article Pastor Berg read. **https://docs.google.com/viewer?a=v&pid=gmail&attid=0.1&thid=125120801335a19e&mt=application/pdf&url=https://mail.google.com/mail/%3Full%3D2%26ik%3D9deac76446%26view%3Datt%26th%3D125120801335a19e%26attid%3D0.1%26disp%3Dattd%26realattid%3Df_g2922vbd0%26zw&sig**

[20]See the article on Dzierzon in *ABC and XYZ*.

[21]Reminiscences xxi, 116-118.



Patent Drawing 2

versial for 50 years.[22] He published *Theorie und Praxis des neuen Bienenfreundes, (Theory and Practice of the New Bee-Friend)* in 1848. Dzierzon had invented a movable comb hive using bars that slid into a groove, the combs being accessible from a side door.[23]

Berg borrowed Wagner's translation of some of Dzierzon's writing for LLL. LLL later wrote: "No words can express the absorbing interest with which I devoured the work. I recognized at once its author as the *Great Master* of modern apiculture."[25]

Through the Summer of 1851, using his improved hive with the space separating the cover and the top bars, LLL never thought of extending his discovery – what we now know as "bee space" – to the sides.[26]

> "It will, no doubt, appear very strange to persons not familiar with the ordinary progress of inventions that the shallow space between the tops of the bars and the board on which the receptacles for surplus honey rested . . . did not at once suggest itself to me that uprights might be fastened to the bars so as to give the same bee-space between the front and rear walls of the hive . . . But I used the shallow space above the bars, for a whole season, without ever connecting the two ideas. . ."[27]

LLL's description of his discovery on October 30, 1851 is classic:

> "Returning late in the afternoon from the apiary, which I had established some two miles from my city home, and pondering, as I had so often done before, how I could get rid of the disagreeable necessity of cutting the attachments of the combs from the wall of the hive . . . the almost self-evident idea of using the same bee-space as in the shallow chamber came into my mind, and in a moment the suspended movable frames, kept at suitable distances from each other and the case containing them, came into being. Seeing by intuition, as it were, the end from the beginning, I could scarcely refrain from shouting out my 'Eureka!' in the open streets."[28]

He returned home and after spending the evening with a friend, drew his discovery in a personal journal.

His Journal

A book – reputed to be the journal in which he recorded his invention on that important night – is part of the Special Collections at Mann Library at Cornell University. Is it indeed that very journal he described? Having examined it I think not, but I believe that it is a very important document, one that deserves being brought to greater attention. Perhaps it can be made available online as part of the Hive and Honeybee Project.[29]

Naile, after some sleuthing, discovered that journal in a dusty attic and donated it to Cornell University. It was displayed at the 2002 Eastern Apicultural Society convention at Cornell, open to the drawing reputed to be the very October 30, 1851 drawing he describes in his Reminiscences.

Disappointingly, internal evidence indicates that it is not the original journal, but rather that it contains text and drawings copied from the original. The LLL's inscription at the front of the journal indicates that he began the book now at Cornell on January 29, 1852, three months after his discovery. The famous drawing occurs not at the beginning, but somewhat into the book, indicating that the he made that drawing some time after he began the book. The book is not a journal, that is, a diary, but a compilation of thought, indicating that much of it is a recopying or digest of information first recorded elsewhere.[30]

I will not describe here the specifics of the actual organization of the

[22]The scientific community greeted this with some skepticism. See "Honeybee Gene Find Ends 150-Year Search" **http://www.sciencedaily.com/releases/2003/08/030822074151.htm** for an article in *Science Daily* that reports the discovery, in 2003, of the genetic signal that triggers the development of a bee into a male or female, with a short discussion of Dzierzon's contribution. *Dzierzon's rational bee-keeping; or The theory and practice of dr. Dzierzon of Carlsmarkt*, Translated by H. Dieck and S. Stutterd, ed. and revised by C. N. Abbott, Published by Houlston & sons, 1882 [14] is available online through Google Books, **http://bees.library.cornell.edu/cgi/t/text/text-idx?c=bees;idno=5017629**

[23]For an entertaining comparison of the Dzierzon and Langstroth hives, see *Gleanings*, Vol. 29, May 1, 1901, 388-90.

[25]**http://books.google.com/books?id=H624AAAAIAAJ&pg=PA389&dq=dzierzon&cd=4#v=onepage&q=dzierzon&f=false**.

[26]LLL describes what we now refer to as "bee space" clearly in his patent documents but does not use the term. The actual term was apparently coined by Heddon in 1885. In his later writings, LLL does use the term. See Kritsky, Gene, *The Quest for the Perfect Hive*, Oxford, 2010, p. 116.

[27]Reminiscences, Feb 1893, p.116.

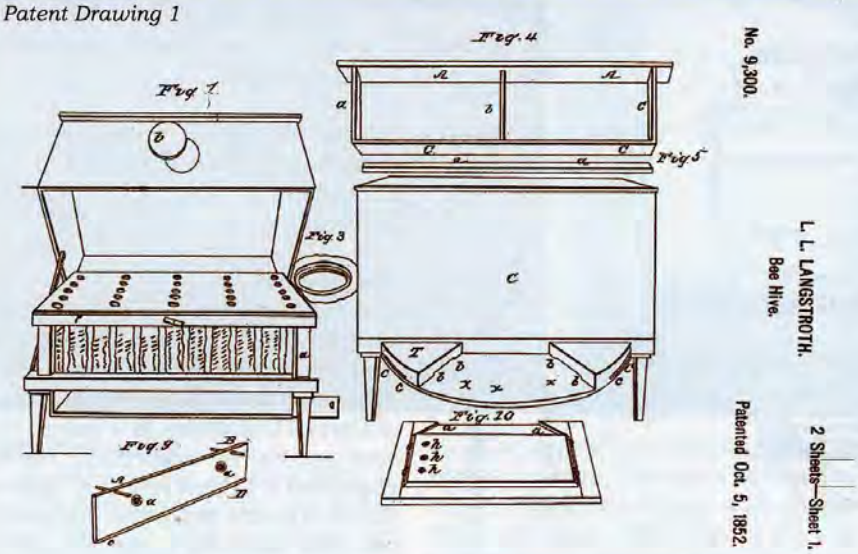
[28]Reminiscences, Feb 1893 p 116.

[29]The Hive and the Honeybee Project is a continuing effort to put classics of apiary science and management online. See **http://bees.library.cornell.edu/**

[30]The book was rebound twice, in 1885 and 1952, and so we don't know its original condition. The volume appears to be a combination of items which were once separate.

[31]*Index Rerum, Or Index of Subjects Intended as a Manual to Aid the Student and Professional Man, in Preparing Himself for Usefulness with an Introduction Illustrating its Utility and Method of Use.* Northhampton, JH Butler, 1834.

Patent Drawing 1



book, which is eccentric, detailed, and interesting. It follows a scheme described in an eight page brochure titled *Index Rerum, Or Index of Subjects Intended as a Manual to Aid the Student and Professional Man, [etc.],*[31] written by Rev. John Todd and published in 1834. LLL bound the complete brochure into the volume. The book follows an alphabetical scheme (but is not strictly alphabetical) and is meant to be not a diary but an index to important concepts in one's reading. Nevertheless, although LLL began by following the brochure's organizational scheme, he soon departed from it and began writing his thoughts, ideas, and preliminary conclusions. Many pages begin with entries such as Atheists, Ability, and Backsliding, but quickly move to considerations of Angry Bees, Artificial Swarms, and Young Queens.

The work is more like DaVinci's notebook than a chronological diary. I only had a few hours to look at the book, and cannot vouch for its overall importance, but my impression is that it should be considered for wider publication. Because of its fragility very few people have studied it. LLL's handwriting can be extremely difficult to read, and an individual scholar can only work on it for a short time before exhaustion creeps in.[32] The production of an online version would take a lot of work, but might reveal the thought processes, and perhaps some novel, unpublished ideas, of this pioneer.

[32]Another volume, his letter copy book, is even more difficult to read.

Trying out the new hive

In November in Philadelphia it is too cold to begin beekeeping experiments, so Langstroth had to wait until the Spring of 1852 to try his invention. To alter his box and top-bar hives he depended on Henry Bourquin, a cabinetmaker and beekeeper, who was in charge of LLL's apiary.[33] It is not clear if LLL did any of the actual carpentry work himself.[34] That Summer he had over one hundred movable frame hives constructed. His invention worked just as he had envisioned it.

On October 5, 1852 he was granted Patent 9300 on his beehive. Anyone today can view Patent 9300 on the World Wide Web, read the text, and see the pictures, but a few caveats are in order. The original 1852 patent was handwritten and was reduced to print in 1912. The 1912 text and pictures, which were set into type and redrawn from the originals, contain errors.[35] For example, the 1912 drawing omits an entrance for the bees to exit and enter the hive, and the printed text refers to "propolis," which is clearly "propolis" in the original. The original text is marked up with printer's symbols to guide the typesetter.

[33]Henry Bourquin's full name was John Henry Bourquin, born in Philadelphia in 1825. He moved to Isanti, Minnesota in 1862 and died there in 1906. In one of the small, delicious ironies of life, his great great great grandson, who had no idea of his ancester's activities with Langstroth, had a summer job that included assembling frames.

[34]LLL wrote that as a lad he did not do any carpentry. A neighbor in Oxford, Ohio, where he lived from 1858 to 1887, said that he had a shop with the "sweet smell of wood shavings" but there is no information about his doing the work himself.

[35]At the National Archives in College Park, Md. I have compared the handwritten and printed versions of the text, and compared a microfilm of the original with the printed version of the drawing.

The original Langstroth hive of Patent 9300, was quite different from the modern Langstroth hive. It was more like a piece of heavy furniture than the relatively light hive boxes we are used to today. For example, the patent calls for the bottom board to be made of "one and a quarter inch stuff." The Langstroth hive, like many other technological breakthroughs, experienced rapid evolution in its first few years. The modern hive is much simplified from the first one, and what we consider the essence, the movable frame, was but one of the features of the new improved hive.

Although the term bee-space does not appear in the patent, he describes the concept clearly:

> I have invented a movable frame . . . [The top of the frame] is about 1" wide . . . [the sides and bottom] are about 1" wide . . . There should be about 3/8" space between [the sides of the frame] and the sides and [the bottom of the frame] and the bottom of the hive. This will prevent the bees from attaching the frame to the sides or bottom board of the hive, hindering its easy removal . . .[36]

The hive's features include variable ventilation ports, and a wax moth larva trap that also serves as an entrance reducer. The box is double glazed glass (rather than wood) to save money and provide insulation. A hinged bottom board (made of that 1¼ inch thick wood), can be released by a latch, which allows one side to swing down with the edge resting on the ground. This permits the bottom board to be cleaned easily, and allows swarms to be hived dumping them on the ground and letting them enter the hive by walking up the ramp. Alternately, rather than being solid, the patent describes an alternative version – a box with a variable closure to allow additional ventilation.[37] An in-

[36]The text in square brackets, [...], explains what, in the patent document, are references to the drawing.

[37]The mechanism of the closure is not drawn properly on the redrawn illustration but is clear on the original drawings.

ner cover with holes permits the bees to make their comb honey directly into tumblers or glass bottles. Zinc plugs stop up the holes that are not in use. Two pairs of legs of unequal length slant the hive forward so that the rain can run off the cover.

In a later article in this series I will describe changes to the patent that LLL made when he obtained a reissue in 1863.[38]

In order to devote his time and resources to the development of the invention, he sold his share of the school in which he taught and resigned his teaching job.

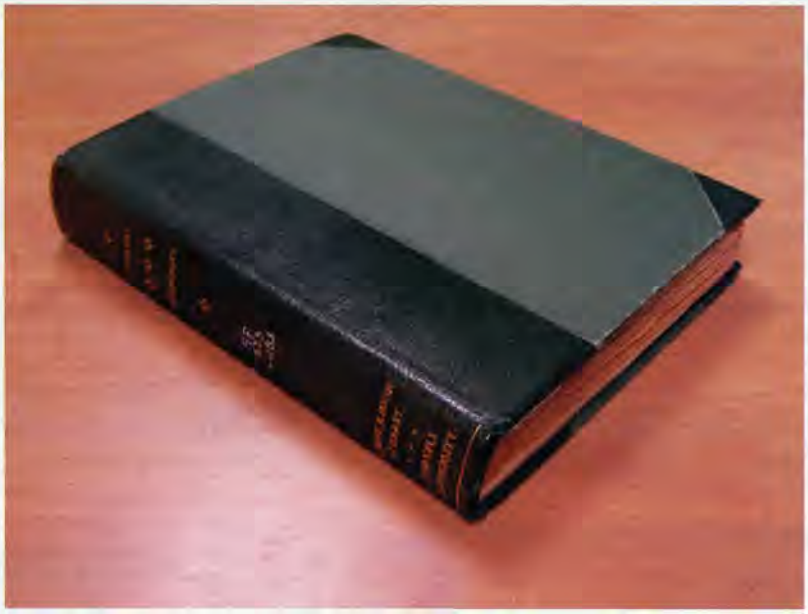
From time to time through his adult life, LLL was suddenly crippled by intense headaches and depression, a condition that sometimes lifted in a short time but sometimes lasted for months. He wrote that, following his recovery from periods of depression, ideas and projects would come to him so quickly that other people seemed to be thinking and acting slowly. During these active times his wife considered him "intolerable." From these descriptions we can theorize that his condition was similar to what we would term bipolar disorder, or manic-depression.

Before the Summer was over, LLL suffered a recurrence of his "head troubles." Completely incapacitated, he could neither work on promoting his invention, nor take on other employment.

Samuel Wagner visited the apiary in August of 1852, and it is an indication that LLL was probably suffering his "head troubles" at that time that Langstroth was not present and the two did not meet. However, Wagner saw enough of LLL's work that he decided not to publish his translation of Dzierzon. He considered Langstroth's system of management to be superior to Dzierzon's, and encouraged LLL to write a book.

Late in the Summer, LLL was unable to work or keep bees and had to sell his apiary. Having resigned his position as principal of the high school, and now being unable to function, he had no way of supporting himself, his wife Anne, and his three children: James, Anne, and Harriet. The future, which had looked so bright, now looked dark and uncertain.

His wife got a position teaching in Philadelphia. LLL had met his future wife, Anne Tucker when he was teaching in a school for young ladies run by her mother and Anne and her two sisters were helping her mother run the school.



In November, Langstroth moved in with his sister and brother-in-law, Margaretta and Almon Brainerd, who lived in Greenfield, Massachusetts, a town where LLL had lived from 1840 to 1848. His son, James Tucker Langstroth, then 15 years old, accompanied him. Almon Brainerd was a prominent attorney, and he and Margaretta bought and were living in the Coleman-Hollister house. This fine old house, designed by the famous architect, Asher Benjamin, had been built in 1796. From 1840 to 1848 LLL had been principal of the School for Young Ladies, which occupied this very house. LLL was to spend six years in Greenfield and vicinity while his wife and daughters lived in Philadelphia, only spending the Summers together.

In Greenfield, Langstroth came out of his doldrums and began writing in a heat. He wrote the manuscript in his worst scrawl and sent the pages to Philadelphia for his wife to transcribe into legible form. A "kind brother in law," probably Almon Brainerd, provided the funds to get the book set into type and printed. In a remarkably short time, in May 1853, *Langstroth on the Hive and Honey-bee* was published.[39]

Langstroth was 42 years old, half way through his long life.

*Marc Hoffman (**soworkthehoneybees@gmail.com**) is a beekeeper in Silver Spring, Maryland. With Matt Redman (**chesapeakesoaps@gmail.com**), he has been doing research about Langstroth for a number of years. See **www.LorenzoLangstroth.com**. Marc has written, and performs, a one-man play about Langstroth, "Bee Man." See **www.BeeManPlay.com**.*

Many thanks to Matt Redman, my research partner, for his contributions to this article. Thanks also to the librarians of: the American Philosophical Society Library; Mann Library at Cornell University; the National Archives II, College Park, Maryland; the National Agricultural Library, Beltsville, Md.; Catholic University Library, Washington, DC. Thanks to Peter Miller, Town Historian, Greenfield, Mass., and to members of the Langstroth family – Lovell and Libby Langstroth of Pacific Grove, Ca. and George Langstroth Cowan of Scranton, S.C. And thanks to my wife and daughter who tolerate (usually) my Langstroth obsession.

[38] Reissue number 1484, May 26, 1863. A reissue gives the patent holder the opportunity to clarify his claims.

[39] I have always wondered if Anne Langstroth played a larger role in making the Hive and the Honeybee the classic it is than she is given credit for. She is always described as a being a mere copyist, making LLL's handwriting legible. But we know from her letters and from her formal writing, e.g. her plea to the patent office for the 1863 reissue of the patent, that she was a fine writer, a strong writer. She was a teacher, used to correcting her students' writing. Could she have been more active than described? We'll likely never know.

Ross Conrad

THE ROAD TO TREATMENT-FREE BEES

Go From 2 to 1, or 1 to 0 Treatments Each Year

Keep *Varroa* mites under control...that has been the name of the game for American beekeepers over the last couple decades. Reducing *Varroa* levels both in Spring prior to the honey flow, and in Autumn following the honey harvest has proven to be effective in preventing colonies from succumbing to excessive mite loads.

Unfortunately, mite treatments that add foreign substances to the hive can contaminate the hive's interior and lead to the buildup of residues in combs made of beeswax. While the negative impacts of such treatments may be sublethal, they have the potential to add considerably to the overall stress that colonies must manage in order to survive.

This is especially true if you are relying on toxic chemicals to control mite populations. However, even if you are using non-toxic or natural treatments, ideally we will want to transition hives to the point where they can prosper without the addition of any foreign substances to the hive at all. This means that no matter what type of *Varroa* treatments you are using, if you are treating for mites twice a year, the next step is to modify your management techniques so that you only have to treat annually.

If you are already treating for *Varroa* only once each year, then perhaps you're ready to start the transition to managing treatment-free bees. The easiest way to reduce or eliminate mite treatments is to simply not treat. Whether we forget, get too busy and don't make the time to treat for *Varroa*, or consciously withhold treatments this approach has significant potential to killing off all our hives. Yet it is argued by some that this "live and let die" approach is the fastest way to develop honey bees that can tolerate *Varroa* and live with mites year after year. This is because such a treatment-free approach will tend to kill off the most susceptible hives and encourage the development of bees that can co-exist with *Varroa* without succumbing to parasitic mite syndrome (PMS). However, withholding foreign materials from your hives and going treatment-free does not have to mean ignoring your mite problems with the likely result of losing all your colonies.

The chances of survival in treatment-free colonies can be substantially increased by utilizing a number of cultural techniques that do not add foreign substances to one's hive. These typically include: year-round screened bottoms, making artificial swarms or nucleus colonies, and employing *Varroa* mite traps.

As noted in previous articles however, the first place to start is with bees that have some level of proven tolerance, or resistant genetics. This includes bees that have strong hygienic tendencies, exhibit *Varroa* sensitive hygiene (VSH) behavior, and/or throw off frequent swarms that interrupt the reproduction cycle of *Varroa*. This may also include bees that have a shorter development time from egg to adult which reduces the number of mites that can be raised during each brood cycle and is championed by proponents of small cell, or natural size comb and foundation.

This brings us to an interesting contradiction in which the majority of scientific research indicates that small cell combs have no significant impact on the level of *Varroa* in a hive. The current scientific thinking is that honey bee development time is controlled by genetics rather than cell size, and yet numerous beekeepers who have switched to small cell comb report that they have been able to discontinue all mite treatments without losing their bees on a regular basis.

Today, there are a growing number of beekeepers

who are using top bar hives (TBH). Beekeepers who use top bar hives are required to regularly destroy comb in order to harvest honey from their hives. Since the combs are not extractable and reusable like full-frame comb, top bar combs must be either squeezed out to produce liquid honey or cut into honeycomb sections. Top bar hives also typically employ the building of natural comb without the aid of foundation. When bees build comb naturally without foundation, they have a tendency to build combs with a cell size that is slightly smaller than the standard sized cells found in combs that they were raised on. This is one of the reasons given by top bar enthusiasts to explain reports that bees from such hives seem healthier than bees kept in conventional Langstroth style hives which tend to rely on man-made foundation to control cell size. Even my own bees that were shaken onto small cell foundation in the Spring of 2008 came through the Winter of 2008-2009 in great shape. In fact, of the hives that died in my beeyards during that Winter, or were weak in the Spring, none were bees that had been transferred to small cell comb. It will be interesting to see if I see similar results this Spring.

This apparent contradiction between science and practical experience combined with the recent revelations about the apparent role essential oils are playing in keeping bees alive in the face of CCD and mites (see *Essential Oils and the Beekeeping Industry's Survival* in last month's *Bee Culture*) has got me thinking a lot about small cell comb. What if the reason behind reports of bees doing so well on small cell and naturally built combs, has nothing to do with the cell size at all? There is growing evidence that it's the removal of old comb and the myriad of virus and fungal diseases they harbor that is the mechanism that may be creating healthier bees in many small cell and natural comb hives.

Until now, most treatment-free *Varroa* controls have tended to focus on bees that have some level of *Varroa* tolerance, or by directly reducing the mite population in some way. All this despite the fact that mites are not what are actually killing off our hives. Sure mites weaken bees by feeding on their haemolymph, but this does not kill them directly. It's the viruses and fungi that are able to enter the holes created in the bee's exoskeleton by the feeding *Varroa* that are the actual cause of death. These pathogens exist both within the mite and on the surfaces of the hive interior which consists primarily of honeycomb. Recent research published in a special CCD issue of the *Journal of Apicultural Research* and discussed by Steve Sheppard in last month's *Bee Culture*, supports the hypothesis that hives can tolerate many more mites than normal when there are fewer pathogens present to sicken the weakened bees. This seems to be at least part of what is going on in hives that are treated with strong doses of pathogen-killing essential oils. By the same token, when old pathogen-laced comb is removed from the hive and the bees are allowed to build new comb that is relatively pathogen-free, their overall health improves and the colony is able to tolerate a much higher population of *Varroa* mites in their midst than would otherwise be the case. (For more on naturally built combs see the February 2010 issue of *Bee Culture*.)

Thus, the final cultural technique that should be added to the list of things that can help beekeepers reduce, or even eliminate their reliance on bi-annual or annual *Varroa* treatments is regular comb replacement. Every beekeeper I am aware of that is keeping bees alive without using mite treatments at all is using some combination of the following: bees with some level of mite-tolerant genetics; year-round screened bottoms; making artificial swarms, splits, or nucleus colonies (often letting the bees raise their own queen); employing *Varroa* mite traps; and regular comb replacement.

Despite that fact there are those that deny the ability to successfully overwinter hives year in and year out without applying some form of mite treatment, the number of treatment-free beekeepers are growing on a yearly basis. The most successful treatment-free beekeepers tend to be those that utilize the greatest number of the above mentioned cultural controls during the course of each season. The one exception being those who are located in African Honey Bee (AHB) territory and whose bees have some level of AHB genetic drift within their colonies through open mated, or superseded queens. BC

Ross Conrad, author of Natural Beekeeping, *regularly conducts organic beekeeping workshops, classes and consultations in between taking care of his own bees. Dancing Bee Gardens, P.O. 43, Middlebury, VT 05753;* ***www.dancingbeegardens.com; dancingbeegardens@hotmail.com.***

TOP BAR HIVES

James E. Tew

Some Comments & Reflections

Ugandan beekeepers working a top bar hive.

What's with your interest in these hives?

In one form or another, they have been around for years; indeed, even many years. As time has passed, I have had experience with various styles of TBHs but I have never claimed to be an authority on this hive design. It's simple enough that experts may not even be required. So what's with the current interest in Top Bar Hives (TBHs)?

At recent meetings, I have had people ask me about the concept of the top bar hives, but they were not just the regular "quick hit" questions. In several instances, the questioner asked if it would be possible to give me a call to talk more about this hive design. Those of you who are curious seem to be more curious than usual. My efforts in this article are conversational rather than reference oriented. A veritable book could be written on this subject – in fact several have been written on this topic.

If you do a web search

A quick web search, using any common search engine, will result in about 12,000 hits. If anyone wants to become truly informed on TBHs, just spend a few months reading that information and you should know all there is to know. Clearly, there is a group of beekeepers who are committed to this style of beekeeping and have taken the time to post their findings, comments and information on the web for the benefit of other beekeepers.

To the Top Bar Hive community

My comments that follow are not intended to support or refute the TBH as an acceptable hive design. The TBH has positive, negative and neutral characteristics. I don't know of any academic research that has been done in the U.S. that could validate claims that some have made on the behalf of this hive style. I sense that there is no harm in saying that this hive is fine for those who like it, but no loss to those who have no interest in the unit.

Along this line of thought, from perusing the web, I realize that many of you have experience and time in developing favored techniques and procedures. My comments on characteristics such as entrance locations, dimensions and management techniques are not intended to choose one over another. This hive design is fluid and flexible. There is no exact technique. Maybe that's why so many of you seem to like the design.

What is a Top Bar Hive?

This hive is a trapezoidal-shaped (shaped like a feed trough) box of varying lengths and widths. The entrance is commonly on the front of the hive but could be on the sides or between top bars. The top bars should be about 1-3/8" wide but can be of any length. Length and depth can vary, but something 11" deep and about 30" long would not be uncommon. A prominent characteristic of the TBH is that the sides slope at about 30° but no more than 40°. The sloping sides discourage bees from firmly attaching the combs to the side walls. Generally, there is no bee space between top bars so they form a solid roof when all are in place.

Justifications for this style hive

No doubt, I have a different mindset on this design colony than some of those who are using it in the U.S. as their primary hive style. The idea – or some variation of this idea – has seemingly been around since the late 1600s.

The ease of construction and the simplistic design make it a logical choice for parts of the world where money and resources are not readily available. Professor Gordon Townsend, Environmental Biology, University of Guelph and the Canadian International Development Agency (CIDA) were instrumental in establishing the hive design that is now known as the Kenya Top Bar Hive (KTBH). Interestingly, the Canadians effort was centered in Uganda. However, Idi Amin's government came to power resulting in the Canadian project being moved to Ngong, Kenya. When I visited Ugandan beekeepers a few years ago, I sensed that they were still disappointed that

Top bar hives.

the popular hive design carried Kenya's name rather than the Ugandan name as was originally intended.

In these areas, one of the most common native hive designs was made from a hollow tree trunk or a section of tree bark that that had the ends closed off and was suspended from trees. It was a sad irony that trees had to be killed in order to make these beehives. A "transitional" hive, such as the top bar hive, would help fill the time interval when these countries were moving from primitive to modern hive equipment. Today, few of these countries have moved from transitional to modern hive designs. Maybe the time has not yet arrived or maybe nationalistic pride is involved, but the TBH continues to be the favored hive design in Eastern Africa.

There is no doubt that keeping bees in TBHs is enjoyable, but it is intentionally more primitive.

Some of my early experiences

For a many years, The Ohio State University hosted international beekeeping students at Wooster, Ohio. Some of the participants from Africa brought with them stories, experiences, and photos of a hive that was commonly called the Kenya Top Bar hive. As are most U.S. beekeepers, I was steeped in the use of the Langstroth hive. Other than some early simple box hives, the Langstroth hive was the only unit with which I had ever kept bees. When introduced to the TBH concept, I found its concept to be fresh and exciting; essentially, it was a different flavor of beekeeping for me. It may not be better, but it was something new and different.

Using written and verbal information gleaned from participants, I concocted my version of TBHs. I kept the length of the top bar at 16 inches in order to be able to occasionally put TBH frames in standard equipment. Of course having no end bars and no bottom bars, the combs could only be in modern hives during cold months or at intervals when absolutely no nectar flow was ongoing. I also built Botswana hives, Tanzania hives and box hives. A student of mine at the time constructed a hive from ½ of a 55 gallon drum. Once the simple concept was made clear, it seemed that nearly anything could be a beehive. We were clearly having a good time.

Since these colonies were primarily designed to house African bees, colonies were frequently suspended from the ground to avoid vibrations that upset surrounding bee colonies. The U.S. top bars rest on improvised legs.

Some benefits of the Top Bar Hive design

1. They are simpler and cheaper to build. Ironically, some of my African students said my hives were too neat – too cleanly made. In its most rudimentary format, these hives could nearly be hacked out with a machete. No doubt my hives were cheaper than standard equipment, but they certainly were not free. I needed labor, lumber and equipment to build my hives. While I built my hives cleanly, the true TBH can be very rustic with imprecision abounding. They could be made from nearly anything – including cow dung and mud. Make no mistake – keeping bees in TBHs is similar in some ways but different in many ways from beekeeping in Langstroth equipment.
2. Combs made of natural comb cell sizes are listed as a positive attribute of TBHs. A present-day suspicion is that our modern bees are too big having developed in abnormally large cells. Smaller cells would produce slightly smaller bees that have a slightly shorter development time; consequently, *Varroa* mites would have a more difficult time completing a life cycle.
3. When harvesting honey, combs must be removed and honey crushed from them. This is both a good and a bad feature of the TBH. In one way, this is good because chemical contaminants do not accumulate in the combs, but on a different hand, this is bad because bees must expend so much time building combs each season.
4. Though a way for supers to be added could be implemented, generally, combs are removed one at a time; therefore, there is no lifting of heavy supers or hive bodies. In the same vein, since the colonies are horizontal, they are conveniently near the ground.
5. Since the top bars are flush with each other (no open space between), the colony can be manipulated without exposing all the bees to the beekeeper. This is particularly important if aggressive bees are being managed.

Some disadvantages to keeping bees in Top Bar hives

1. Since there are neither end bars nor bottom bars on TBH top bars, if TBHs are moved combs readily break and collapse. The few times that I have to move mine, I turned them upside down for the duration of the trip. None of us who were moving the colonies were bored.
2. Some will argue with the assertion that all bee colonies don't care for building a nest horizontally compared to building a nest vertically, but the perception remains that bees do not like horizontal nests as well as vertical nests.
3. Comb-building bees commonly cross over to the neighboring combs; a bit like a train moving onto a siding. A mess results when these connected combs must be removed. The comb is simply cut from the top bar. If the comb is filled with brood, this could be a serious loss to the colony – especially if more than one comb should be

affected.

4. Supplemental traditional beekeeping equipment is normally not usable. For instance, top feeders or division board feeders will not work in TBHs,
5. Related to #4, combs cannot readily be removed and extracted. But in fact, an extractor does exist that could be used to extract honey from TBH combs, but if one is going to buy extracting equipment and extract in common ways, why not just use standard equipment?

Comb construction needs more comments. TBH proponents state that bees have the liberty of building combs to their dimensions – not ours. This is true to a degree. Bees in a TBH can build individual cells to their dimensions but we still require bees to build combs that are generally removable and that are attached to top bars. If it were truly left to the bees, there would be no starter marks and bees would naturally build cross combs – which is the way they like their affairs – crooked, wavy combs and not straight combs. It appears that neither top bar hives nor standard hive designs truly meet the bees' needs for comb construction.

The general frame design

I have made two types of frames for TBHs. One was a frame on which I beveled each lower edge of the top bar resulting in a rough 45° point on the bottom of the top bar. These "leading edges" become attachment points for comb-building bees. This idea was used in bee hive designs of long ago.

A second style I constructed was a split top bar design. I ripped the top bar in half and installed a small starter strip of foundation between the halves. Then the halves were nailed back together. These wax starter strips served as starting points for comb-building bees. Along this line of thought, a groove could be cut and filled with molten beeswax; again to serve as a starting point for construction bees.

Plans for complete Top Bar Hives

Plans for constructing a presentable TBH can be found at: **www.MotherEarthNews.com** (search for "keeping bees") or at: **http://www.tc.umn.edu/~reute001/Plan%20files/pTop%20bar%20Kenya.pdf**

You decide

Is this type of beehive for you and your bees? You decide. The original intent for this hive design was for remote areas of the world where modern contrivances were not readily available. Very aggressive bees were to be kept in this equipment and the equipment needed to be very simple and inexpensive. At best, the hive was expected to be primitive and essentially be filled with disposable combs. In this country, we have modified the original intent, using lumber and woodworking equipment that is not available to much of the world, but there is no harm in that modification.

There is no doubt that keeping bees in TBHs is enjoyable and refreshing but I sense that there is not a great need for most of us to chuck our standard equipment bought from glossy catalogs for a method of keeping bees that is intentionally more primitive.

A yard of top bar hives housing aggressive Ugandan bees.

An aside

The TBHs that I built years ago have been in an open storage barn for about the past 20 years. I estimate that during that time, there has been a wild colony of bees nesting in that stored equipment for about 16 of those 20 years. I never bother them. I never check them. They just do their thing. Interesting, isn't it? BC

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All The Buzzz in...

Hello Friends,

I am so proud of each and every one of you. You all have shown an interest in bees and want to learn more. You are the best!

Bee B. Queen

Write a poem and share it with your bee buddies.

Brianna Renneker, 7, IA

Emma Lee, 10, OH

Jaella Toppen, 6, MI

Haley Zubrzychi, 6, MA

"I didn't know bees had hair."
John

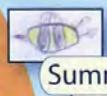
Bee Buddies Bonanza

This month we would like to share some of the work and creations of our bee buddies from around the country and Canada too!

Evalyn and her mom Krista are keeping bees in the city of Austin using a handmade top bar hive.

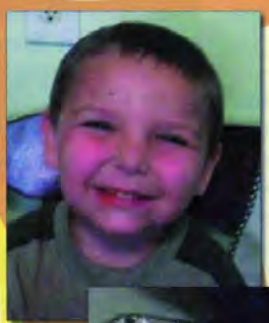
Crist Mast, 9, OH

Jaime



Summer

"I did not know there are different kinds of bees."
Demarcus



Adam Benes, a 4 year old from Ohio, helped his mom make this cupcake bee for a birthday party. Everyone loved it! You can make your own. Make the cupcakes using a cake mix. Make yellow icing using food coloring. Frosting tubes can be used to draw the eyes and body stripes. Use lemon drop candy to make the head, banana chips for the wings, and candy corn for stinger.

Sydney Peterson, age 6, lives in Indiana. She and her dad John, were inspired to build their own mason bee house from an article in the August 2009 Kids Page. They did a beautiful job. But it didn't end there. They are now building a top bar hive together. Sydney is very excited to be a beekeeper and a wood-worker. Even though she is only in kindergarten she says, "I like to learn stuff. I like honey."

Hayden

"I learned soooo much. My favorite part was the whole part."
Dormevil

Bee kid's corner

Produced by Kim Lehman -www.kim.lehman.com
www.beeculture.com
April 2010

The Hive of Bees

By Bethany Isaac, 11, NS Canada

Once upon a time there was a hive of bees. The hive had drones, worker bees, field bees, and a queen. The workers had to collect honey for the others to eat. One day they heard a noise. It was a truck coming to get all the honey from the yard. The bees did not like that idea so they got to work stinging. The beekeepers finally went away but they did come again on Monday. One night they heard another noise. It was a bear coming to eat their precious honey. He tipped the hive of honey. Naughty creature! Then it finally went away into the forest. One day a worker bee was drinking nectar from flowers and flew away, away, away, so that she wouldn't get hurt.

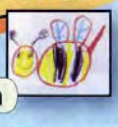
Deborah Toppen, 10, MI

Blondine

Jarid

Hannah

Parris

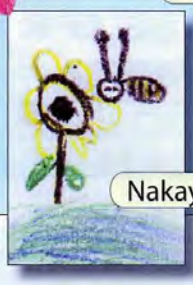


Christa

Duncan

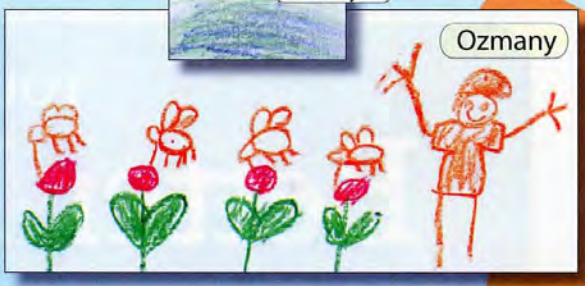
Sunny South Bee Buddies

The National Beekeeping Convention was in Orlando, Florida this year. Here are some pictures and quotes from our Lake Silver Elementary bee buddies.



Nakayla

"I really liked learning about bees. I did not know they helped us in so many ways."
Styles



Ozmany

"I never noticed how amazing bees are until now."
Blondine

Joshua

"I learned to thank bees for my food."
Jarid

How do bees make the buzzing sound?
Tragger Verdieu, Orlando, FL

Bees buzz by vibrating their wings and bodies and pushing air through spiracles — tiny holes located along the side of the bee's body that the bees use to breathe.

There is very exciting research happening at the University of Montana and Bee Alert Technology Inc. Researchers are discovering that the buzz of a honey bee is a remarkable way bees communicate.

With new equipment and computers we can now recognize different bee sounds that our ears can't hear. We've known that bees will make different sounds when upset or when the queen is missing. Now it has been discovered that the sounds bees make change when there are toxic chemicals present and when bees have varroa mites or foulbrood.

Beecome a Bee Buddy

Send two self addressed stamped envelopes and the following information to: Bee Buddies, PO Box 2743, Austin, TX 78768. We will send you a membership card, a prize and a birthday surprise!

Name: _____

Address: _____

City, State, Zip code _____

Age: _____ Birthday: _____

E-mail (optional) _____

Send all questions, photos and artwork to: beebuddies@hotmail.com or mail to the above address.

GloryBee FOODS . . .

Dewey Caron

This Oregon business sells honey, bee supplies, and other all natural food products. And this year is a big supporter of the 2010 WAS meeting.

In this day of big Ag mergers and consolidations, it is refreshing to still find a successful family-run business. Dick and Pat Turanski started Glorybee Country Store from their garage in 1975 as an outlet for their own honey. Dick started with 25 colonies, expanded to 40 and eventually to 325 colonies but within eight years found he couldn't produce enough honey so in 1983 he decided to sell his bees (except for a couple of backyard colonies) to concentrate on the expanding business. The rest, as they say, is history!

Today GloryBee Foods, headquartered in Eugene, Oregon, employs about 135 people. There also is a satellite sales office located in Seattle, Washington. The company occupies 88,000 sq ft in owned and leased buildings scattered on Eugene's west side in a half-dozen buildings. Beekeepers visit the retail store at 55 Seneca Avenue, and in nearby warehouses over 100,000 pounds of honey is processed, repacked and rebottled each week. They sell 1000-1500 items in 4500+ varieties of natural and organic foods, with food industry natural products now dominating. GloryBee remains family owned. Dick still is in charge, Pat remains an active contributor and son Alan and daughter RaeJean Wilson and her husband are all daily involved in the company. A third daughter is not an active participant but shares ownership with Alan and RaeJean.

Although bee products and honey now account for less than 25% of sales volume, products of the beehive have been their driving force in expansion. They have their own fleet of trucks delivering over 330,000 pounds of ingredients per week, primarily to the food business industry. They also ship overseas to over 20 countries, primarily in the Middle East and Asia, and have a thriving full service Mail Order business which ships an estimated 500+ packages per week.

GloryBee Food sells organic honey and specializes in source labeled honey varieties produced by beekeepers in the Pacific Northwest. Free-trade Organic honey comes predominately from Brazil – Dick has personally gone around the world seeking pure and organic honey and other food products. All their honey is heated gently and packed in containers from two ounce containers to gallon and even 40 lb. buckets. All bee products feature the unique GloryBee label of two bears sharing honey on one spoon, "robbed" from an overturned skep.

Dick, a third generation beekeeper, says he started the business after College (he was an Economics major) because his gold and silver commodities trading work was not satisfying. After a chance to help a friend remove honey from colonies, he said "the warm, fresh, poison oak honey was completely fascinating and enticing and it was captivating." Initially the back of the garage was their honey extracting and bottling facility and the freezer their sales "table."

One day while recruiting customers, Dick stopped by a local creamery and when they starting using his honey for a popular yogurt, Dick needed to buy honey from other beekeepers to meet increasing demand. He started selling bee supplies, initially as an agent for Ruhl Bee Supply in Portland, until he found a local manufacturer of woodenware. In 1983 Dick and wife Pat developed the Aunt Patty product line, initially with the addition of molasses. Today the brand is still used on a wide variety of sweeteners (except honey which remains with the GloryBee branding) selling healthy/organic ingredients; spices, grains, seeds, nuts, dried fruits, oils, baking products and of course sweeteners.

He says he was hooked completely to his business venture with sales

Author (right) with Dick Turanski at GloryBee retail store sign.

Dick Turanski preparing to install package bees on Bee Day at GloryBee.

Jason, one of the knowledgeable beekeepers that work at Glory-Bee.

of $16,000 in honey and $20,000 in bee equipment the first year. He has continued to expand his business since with beekeeping and beehive products continuing as the "heart" of the expansion. Annual growth, until the latest recession, topped 15% for the previous five years. The recent downturn has allowed them to upgrade company software by implementing a new computer system. It has also temporarily shelved development of an industrial site to relocate from their current scattered locations to a single green, sustainable facility on the outskirts of Eugene.

Part of the business philosophy and success of GloryBee has been education and finding the "hot market niche." One such success was pioneering a flavored honeystick. Oregon beekeeper Glen Peters first developed the honey-filled clear plastic tubes (straws) in 1982, testing their sales potential in a local farmers market. They became so popular Glen quickly found his 150 colonies couldn't produce enough honey, especially once he perfected the equipment to produce 100,000 Nature Kick straws a day. Dick, who was distributing the Honey filled straws, says the idea for incorporating natural flavors into the straws came from his childhood summers working on the peppermint farm in Talbot, Oregon of Don Turbridge, best friend of his dad (his father Ted Turanski was killed in WWII when Dick was 10). Recalling the potential health benefits of peppermint oil, he found a way to merge the two. Today over 20 different natural flavors and colors are used with the 5gm HoneyStixs and GloryBee Foods has become the major outlet for this still highly popular natural product.

Dick incorporated bee education into his business from the beginning. He signed up to teach beekeeping at the local Lane Community College on a friend's recommendation in 1976. Over 80 persons showed up the first night so they had to find a larger room to host the group. He called upon local experts, and his bee mentors, Herman Larson (who worked bees on crutches as he had only one leg) and long-time Oregon semi-commercial beekeeper Orval Bassett to help with the course.

Dick continued teaching the beekeeping course for 15 years when his growing business and lack of time, even for his few backyard colonies (he sold the bulk of his bees in 1983), left too little time to teach. He turned the course over to the Lane County Beekeepers Association, which he had helped found during that time. The Association still offers a popular bee course which fills to capacity each spring, and which Dick continues to promote on the company website.

Dick's continuing major educational effort is "Bee weekend" in mid-April. The GloryBee retail store gears up and offers specials for the main attraction of package bee distribution (from customer pre-orders). To demonstrate to newbees how to do it, Dick installs a dozen or more packages in the parking lot Friday and Saturday to demonstrate the best way to install packages. He states "educating people about the importance of bees can help keep them alive . . . bees are most importantly the environmental barometer of how things are doing in nature." Last Spring over 500 packages supplied by a California package beekeeper were distributed. The 14 "nucs" developed from the demonstrations this past Spring were subsequently sold after they become established six weeks later.

Education continues to be important to GloryBee. The annual catalogue is filled with tips and useful information of use to customers. The outlet store offers several workshops on topics such as beeswax candle making, soaps and cosmetics and making chocolates. One item initially tried but since discontinued has been honey candies. The website offers a 15 lesson Beekeeping 101. **www.beeedcation.com/Beeeducation/index**.

Several of his 135 employees "carry" work home with them as they have become beekeepers. Dick still has backyard colonies to manage and this year he went racing out with an employee and one of the company forklifts to capture a nearby swarm in a tree. His son Alan has continued to manage the colony in his backyard.

Dick is a person with deep religious conviction. In a recent Fall interview with the Eugene Register-Guard, he said that although he attributed his success to 12-15 individuals who "came along at strategic times opening doors for me and my company . . . I prefer to give God the credit for what's happened than to say hey, look what Dick Turanski did." He is involved in "Beekeepers for Christ" which trains beekeepers and raises money for beekeeping supplies. He has taught beekeeping in Uganda, returning five times to help this faith-supported community.

Dick has been a faithful supporter of the local bee industry. He will be a MAJOR sponsor for WAS 2010 in Salem, Oregon Aug 30-Sept 2. Beekeepers driving to the Salem meeting coming from the south can make a short side excursion off I5 via the bypass to Robinson Rd then east to Seneca Rd for a visit to the Glory-Bee retail store at 55 Seneca Rd.

Find out more about GloryBee Food at **www.glorybee.com**, and look over the WAS program at **http://groups.ucamr.org/WAS**. BC

What Should I Buy?

Larry Connor

There are both advantages and disadvantages to the three major options available for purchasing beehives (A hive is the combined equipment with bees installed, or ready to be installed). These are (1) the purchase of full-sized colonies, (2) (also called nuclei), nukes, nucs, increase, set-offs, splits, and divides, and (3) packaged bees. Here is a summary of the pros and cons:

Full-sized colonies – This may be the best and fastest way to obtain a colony of bees, and may initially be the most expensive, but puts you into full colony ownership from the start of your beekeeping career. Look for a local beekeeper who will deliver, or help you move, the bees to the site you have selected for bees. The location should be solid and level, with concrete, brick or pressure-treated wood used to raise the hive off the ground. Look for a colony with a minimum of two deep hive bodies (10 or eight frame units), or the equivalent in medium depth boxes (usually three). The colony should be new or nearly new (perhaps put into use the previous bee season). The frames should be nailed or stapled and glued, and the foundation firmly installed and has been in the hive long enough for all the combs to be drawn out (where the bees have added beeswax to the hexagon template). If you obtain more equipment, such as honey supers, this is good, but expect to pay more for this. If you purchase the colony after a nectar flow, the price may include the honey crop (you should pay more) but you may be able to harvest some of the honey from the hive and recover part of your investment.

On the negative side, full-sized colonies can be diseased with one or more of several bee diseases and/or have a high number of parasitic mites. The beekeeper should be able to explain the treatment plan history (chemical or non-chemical) that has been used on this colony. In some areas, state and provincial bee inspectors must, by law, provide certification that the colony is disease and mite free or has been inspected and offer the results.

Purchase of an overwintered colony in the Spring buildup period will provide you with the chance to make up new colonies, called increase colonies, during the Spring and into the Summer months – if the colony is strong and is being fed to stimulate growth or it is a 'normal' season and food is coming in at a rate to promote growth. This is advanced beekeeping in the eyes of many instructors, but it is not especially difficult (perhaps a bit daunting), but you can do it if you have a good teacher-mentor-trainer helping you with your beekeeping. Ironically, purchase of a full sized colony in the Spring of the season has the potential of giving you many colonies at the end of the year, but only if you comprehend what is happening to the bees and work wisely to provide good management of the new colonies. If you do not follow standard practices, you may loose all the bees and the money you paid for them. No refunds, so buyers beware!

Increase or Nucleus Hives – From Florida to Canada beekeepers make new colonies in the late Winter and Spring by making increase colonies. This is standard practice for large-scale professional beekeepers, allowing operations to divide an overwintered colony into two to five colonies by separating some of the frames of bees, brood and honey into smaller colonies and giving each new colony a queen cell, virgin queen or mated queen.

These colonies are offered for sale by a number of beekeepers. Northern area beekeepers make

Installing a package is generally safe and uncomplicated. However, without prior experience or training, or a mentor to help, this means of beginning beekeeping can go astray.

A full sized colony, sitting next to a nuc, for comparison.

Buying full sized colonies gets you going fast, but these colonies can arrive with their own set of problems. Be sure to have them inspected by a knowledgeable beekeeper or inspector before you buy, rather than after.

An easy-to-capture free hanging swarm is an ideal way to get free bees...but know what you are getting, and how to get them home.

up increase colonies in the early to mid Spring by purchasing Sunbelt queens, feeding heavily and selling the colonies available several weeks later, once the queen is mated, laying and the colony is stronger. Northern beekeepers who produce queens for themselves, or use natural swarm cells, will have these increase colonies available later in the Spring. This may result missing the early nectar crop (which the bees convert into either more bees or surplus honey). New beekeepers must learn where and when their major nectar flows happen in their area, and listen to their trainer for an ideal suggested time of purchase of nuclei hives.

When you obtain your nucleus it will contain (hopefully) three to five frames of bees and brood in all stages (eggs, larvae and pupae). There should be a wide coverage of worker bees over all the frames. Look for newer combs (used one or two seasons) with well drawn beeswax comb. There should not be a large area of drone brood on this comb, since these colonies are too small for heavy drone production. The queen could either be one that was overwintered in a nucleus, or produced from a number of methods that current Spring. Ask about the history of the queen. If you want local stock, make sure that the queen was raised locally, since it is very easy to get queens from warmer places to make up the first batch of increase. This is not a criticism, but some people have expectations and they are not always possible to meet! Have your trainer mark the thorax of the queen with a spot of paint so you can spot her as you work your hives. You can learn how to do this by practicing on a few drones – but only after you are 100% sure you can tell them apart!

In the past I have observed beekeeping operations using a questionable business model to get rid of old, often damaged, brood combs by making up increase colonies with them. Again, if this gives you a good price, it may be fine, but the older the comb, the greater the chance it carries agricultural and apiary-related pesticides, and has damaged areas. Again, this is where an experienced teacher can be a great help in looking at the frames and bees to make sure they are suitable for purchase.

Packaged Bees – The least expensive method of obtaining colonies is to arrange for delivery of Sunbelt packages of bees. These are usually two or three pounds of young nurse and house bees and a new (and foreign to the workers) queen that has just started to lay eggs. These bees must be moved from Sunbelt locations and delivered to your area by a local beekeeper or by the U.S. Postal Service. They cannot be shipped to Canada from the United States.

The biggest down side of packaged bees is the fact that this is an unbalanced unit subjected to the stress of travel over great distances. There is no drawn comb or brood in the hive, the queen is young and often not fully matured, and the bees are often subjected to stressful conditions while in transit – from overheating to Spring blizzards!

After packaged bees are installed early in the season and feeding and natural nectar and pollen flows occur in the right amount at the right time, in just six weeks or sooner they are ready for a second hive body. When conditions are poor, the bees arrive weakened or dead, fail to buildup due to early Spring weather, the queen fails and the colony becomes hopelessly queenless, and other problems. Few package bee producers guarantee live delivery and successful installation, so the risk is all in the hands of the buyer. This can be a great concern when the purchaser is new to beekeeping and is working alone. I have started to call these "drive by beekeepers", since they drive by the pickup spot to get their bees, and then take them home. They have not had training and are not working with an experienced beekeeper. They may let the bees stay in the package for up to two weeks and then complain that the bees are not lookin' too good. I really discourage this practice, since it does few people any good. Even the packaged bee producers will challenge these drive by beekeepers since they are often dangerously ignorant. Get some training whichever method you use. Take a class, find a mentor. This is a great way to insure your success in the first year of beekeeping, and your continued success in future years, since you started out with a good instructor/mentor.

Free Bees

Okay, true confession time. I started writing this article at my desk in Michigan, but I am finishing it by a pool overlooking Buck Island (A U.S. Federal Monument with an underground trail for snorkelers) in St. Croix. Yes, I am wearing swim trunks while yet another storm hits the Mainland U.S., but deadlines must be honored. I just finished a three-day class on queen rearing for Islanders. Most of the bees on the Virgin Islands are mostly African, and it is the hope of the organizers to move toward some sort of stock improvement program. The first step is to teach some queen rearing.

Many of the Islanders increase their colony numbers by removing swarms from buildings. Some are good colonies, and some are not very useful. They use thin electrical wire to fasten the pieces of comb to the top bar frames, a system which is pretty popular here.

Removing bees from buildings, catching swarms, and other practices are methods beekeepers can get bees without spending any money, but the practice is not always free even if you charge the property owner for the service. Why? Lost wages, travel costs of a truck or car, and poor success rates can be part of this. So I suggest you let the more experienced beekeepers do the removals, or 'cut-outs' as they are often called.

Free hanging swarms are much easier to capture, especially if the bees cooperate and the swarm is reachable from the ground. Once you start with bees you can get on a 'Swarm List' at the local offices of government, extension and the fire and police departments. Some years there are many swarms, and if you have time away from work (or do not have a job – or one like mine), this is an excellent way to get more colonies without spending money out-of-pocket.

Put some trust in the advice of your trainer. Unless they have a vested commercial interest in one of the systems described here, they should be able to direct you to the choice that will work in your area. BC

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*Check **www.wicwas.com** for Dr. Connor's three Essentials books, or ask for them at your local bee supply dealership. And while another tropical queen rearing class is not on the books as of today, there are three scheduled in MI and one in CT this Spring and Summer. If there is still room, we would like to have people learn about this vital part of beekeeping.*

Make A CLOAK BOARD

Ed Simon

One Colony Raises Lots Of Queens

When researching the many methods of raising queens I found a reference to the Cloake Board system. This device is used to provide both a queen-rite and a queen-less colony from a single colony. Subsequently, I found only one commercially available Cloake Board. When possible I make as much equipment as possible. Therefore I decided to make a Cloake Board. The final cost was the cost of one queen excluder and one 1" x 6" x 6' pine board.

The Cloake System – Developed by Harry Cloake in the 1970s

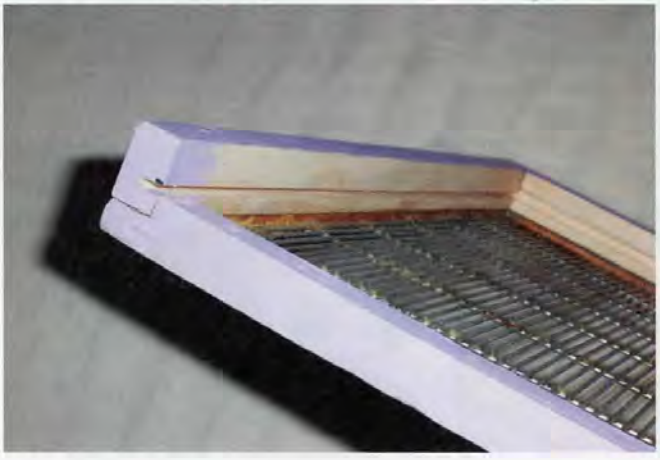
The Cloake System consists of a Cloake Board that is installed between brood boxes. It consists of a queen excluder and a solid separator/divider board. The separator/divider board is either installed (slid in) to change a single colony into two colonies or removed to change two colonies into a single colony. The first colony is a queen-rite colony which is used to provide eggs and larvae. The second colony, which is queen-less is used as a cell builder colony. How to use this system can be found on the internet by searching for the keywords "Cloake Board."

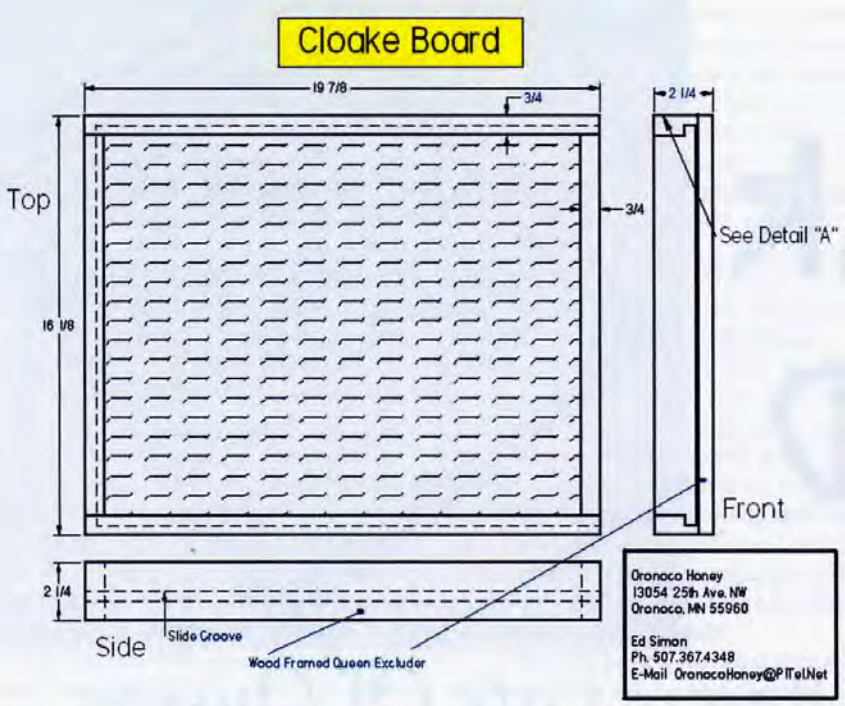
Building the Cloake Board

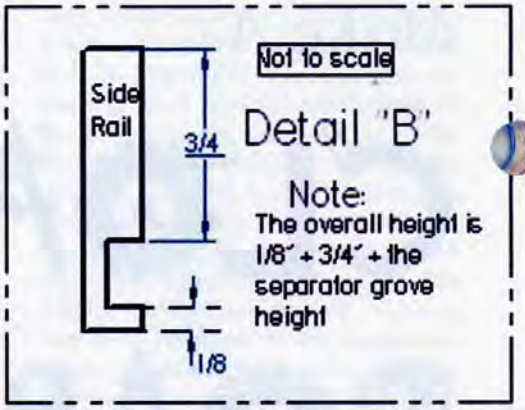
Creation of the Cloake Board using a wooden framed queen excluder turned out to be extremely easy. So much so that I built a second Cloake Board using one of the rimless plastic queen excluders. Measurements are provided for the standard Langstroth hive.

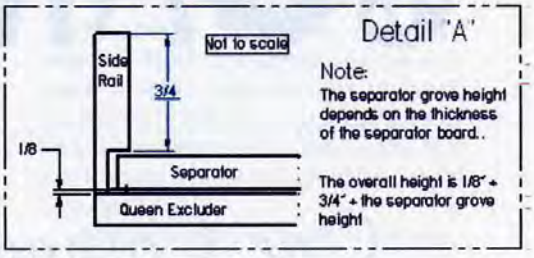
Step #1 – You need a sheet of ¼" plywood that is large enough to be used as the separator board. It should be as wide as your queen excluder and about 2" longer. It will be trimmed to the exact measurement once the Cloake Board frame is completed.

Step #2 – Building the side rails for the separator board was easily accomplished by using a 1" x 6" x 6' piece of lumber. 1/8" from the edge of the board, cut a groove 3/8" deep and 3/8" wide for the length of the board. The groove must be wide enough to allow the separator board to slide smoothly. A little wiggle room is needed in case the wood swells or is misaligned.









Step #3 – Rip cut the board ¾" above the groove cut in step #2. The profile for the resulting board should look like the side rail in the diagram Detail "B."

Step #4 –Cut the rail created in step #3 to the width and length of your queen separator. You should have two side pieces about 19-7/8" long and one end piece about 14-5/8" long.

Step #5 – Bevel the groove on the shorter (back) piece using a utility knife and sandpaper. This will give the separator board a ramp to slide into when you are closing it. See Fig. #2

Step #6 –Using a good grade of exterior wood glue and small nails or brads attach the three pieces to one side of the wood framed queen separator. Place the groove closest to the queen excluder. Be careful to nail only on the outside 3/8" of the wood. You don't want the nails to extend into the groove.

Step #7– On the outside corners there should be two grooves showing where the sides meet the end piece. Use a hot glue gun or a piece of wood to plug these grooves.

Step #8 – Rip another 1/8" of wood about 14-5/8" long to be used to build up the front of the queen excluder to match the bottom of the grooves on the sides. Glue and nail this into place.

Step #9 – Cut the ¼" plywood separator board so it will fit inside the grooves and slide in and out. Add a couple of inches to the length so you will have something to grab when inserting or removing the slide. My separator board measured 15 ¼" x 21 ½". Hint: When using the Cloake Board, put petroleum jelly in the grooves to reduce friction and hopefully the buildup of propolis.

Step #10 – Sand the edges of the separator board. It has to slide smoothly in the grooves. Bevel one end (back) of the separator board so it can guide itself into the end groove.

Step #11 – Give the outsides of the Cloake Board a couple of coats of exterior paint that you rescued from the local recycling center.

Changes to make when using a plastic queen excluder

When using a plastic queen excluder, the Cloake Board will be lighter and thinner. The construction of the board differs only in that a second set of ¼" laths are placed on the underside of the plastic queen excluder to give it a little strength. Some plastic queen excluders are wider than a standard hive. They need to be trimmed to the standard hive width. To help with this, they may have a groove in the plastic to show the standard width. Remove the extra plastic so the queen excluder fits with no plastic extending out the side. The gluing and nailing of the top and bottom pieces should be done at the same time by using one brad to penetrate from the bottom ¼" lathe through the plastic queen excluder into the side rails.

Conclusion

Considering the ease of construction, the Cloake Board should be a viable alternative for small-scale beekeepers who want to raise queens but can't afford to dedicate one colony as a cell builder. BC

Ed Simon, sometimes known as The Cheapskate Beekeeper, keeps bees and saves money in Oronoco, Minnesota.

An Indirect Way To

Install A Package

No dumping, and no bees in the air.

Al Avitabile
Diana Sammataro

Installing a package of bees into a hive can be a daunting task, especially for someone who is about to do so for the first time. I recall that in the Spring of 1965, I picked up my first three packages at the Bethlehem, Connecticut Post Office and placed them in the backseat of my car. On the drive home the buzzing of the bees made me acutely aware of how much pain those stingers could inflict. I began to wonder how I talked myself into becoming involved with these insects, especially in such great numbers (there are about 10,000 bees in each three-pound package of bees).

As I continued my journey home, my thoughts turned to the realization that, in order to hive these bees, I would have to release them from their packages. I started to get nervous but knew I had to deal with the task at hand. Methods of installing packages can be found in most beekeeping books, learned at meetings, by taking a short course on beekeeping, or, perhaps better yet, by enlisting the help of an experienced beekeeper.

In all cases, the method of releasing bees from their packages at the time of installation falls into two major categories: the Direct Method or the Indirect Method of Release. The Indirect Method is so named because the release of the queen from the queen cage is delayed; whereas, when using the Direct Method, the queen is released immediately. Regardless of which method is chosen, there are variations as to where and how the bees are released from their packages.

In general, Indirect Release appears to be the safer of the two because this method provides the bees accompanying the queen with more time to become familiar with her, before she is released among them. Remember, in producing packages, bees are shaken from their hive and given a newly mated queen, while their own queen remains with the hive from which they were removed.

A few years ago we were introduced to a variation of one of the Indirect Methods, which we believe will provide the beginner with a nearly seamless transition for installing a package. This approach is known around here as the Hansen Method, which was introduced by Henry "Hank" Hansen and his son, Jonathan, who reside in Chaplin, Connecticut where they have been keeping bees for over 20 years while producing honey, rearing queens, and selling bee packages. At present they care for more than 200 colonies.

We have modified their method by using three hive bodies instead of two, added fondant, pollen supplements or substitutes, and began by placing the syrup feeder inside of hive body #3. *Areas of this text specifically referring to the Hansen Method are underlined.*

The Hansen Method (with our modifications) requires the following equipment: three (3) deep-hive bodies, two of which are empty, and one (hive body #2) which should contain ten (10) frames with foundation, or drawn comb, or a combination of both; one entrance reducer; an inner cover and an outer cover.

The following paragraphs describe the preparations required in hiving a package regardless of which method is used. As in all methods, the hive components should be ready and in place at the location where the bees are to be installed. While the hive sits empty of bees, the entrance should be closed with an entrance reducer to keep out mice and other intruding creatures.

Weather/Food Availability

Weather during the onset of Spring is very often a mixed bag; nevertheless, it is the season (exact dates for installation are latitude dependent and April is usually best in most northern states) that coincides with the installation of packages. The variations in weather conditions can be problematic. Consecutive days of sun and warmth are, of course, beneficial, but those that are cold

and overcast and interspersed with periods of precipitation will restrict or curtail foraging flights. In addition, flowering plants, which give the bees' their primary supply of nectar (carbohydrate) and pollen (proteins, fats, vitamins, and minerals), are limited in March and April. Given these conditions and the fact that most start-up colonies begin with empty comb (which contains no food), the newly hived bees need to be fed sugar syrup and fondant (substitutes for nectar), as well as pollen supplements (which include pollen) or substitutes (which exclude pollen) in place of fresh pollen. The importance of supplying supplements and substitutes when natural pollen is unavailable, or in limited supply, can be made clear by understanding the role that pollen plays in fulfilling a colony's dietary requirements. Nurse bees (Oliver, 2010) are specialized to digest pollen and convert it into protein-rich jelly, a product they, in turn, feed to the queen, the brood and the protein-hungry foragers. The importance of these individuals to the colony is well known. The brood represents future generations; the queen, by way of her pheromones, maintains the social order of the colony and is the mother of all its members; the foragers are the collectors of nectar, pollen, propolis, and water. Obviously, one enhances the opportunity for a successful outcome by providing bees with these essential dietary requirements during this period.

Arrival of the Package

When the package arrives, using a mister spray containing a 1:1 sugar-water mix, spray the mix on the screened portions of the package. This application may be repeated several times, as long as the bees quickly remove the syrup from the screens; however, be sure not to soak or wet down the bees. This feeding will help to "settle" the bees, making them easier to handle. If installation is delayed, the package may be placed in a cool darkened room (basement or garage comes to mind). Delaying installation should be prevented whenever possible.

Opening the Package/Retrieving the Queen

When it is ready to be installed, transport the package to the beeyard and remove the lid from the top. Once removed, the top of the feeder can, a tin can containing sugar syrup which provides food for the bees while they are in transit, is exposed as well as part of the queen cage, which is usually suspended adjacent to the feeder can. The queen cage contains the queen and sometimes a few attendant worker bees, and sometimes she's in there alone.

In many cases, in order to withdraw the queen cage from the package, the feeder can must first be removed. If this is the case, spray the bees with syrup, then gently jar the package on the ground in order to dislodge the bees clustering around the feeder can and queen cage. Once the bees have dropped to the bottom of the package, remove the can and queen cage and quickly replace the lid, otherwise the bees will begin to leave the package. This potentially chaotic event may unnerve the beekeeper, especially a beginner.

Handling the Queen Cage

Queen safety is paramount at this point. With successful acceptance critical to the colony's future keeping the queen safe from hostility from the colony bees for several days is suggested. Therefore, *do not* remove either cork from the cages or cap from the plastic cage, for at least three or four days.

Positioning the Queen Cage

Position the cage to the left or right of the oblong hole of the inner cover, but not directly under it. By not placing the queen cage directly under the oblong hole, you avoid the possibility of syrup leaking from the feeder and dripping onto the cage. When suspending the wooden cage, the screen, and as much as possible of the "netting" on the plastic cage, should be accessible to the bees. This provides them with much-needed visual, tactile, and pheromonal contact with the queen. To accommodate this extra space, remove one frame of foundation and snug the two frames on either side of the queen cage together to help keep the cage in place. This, with the wire or disk insures the cage will stay in place.

How to Suspend the Queen Cage

To suspend the cage, use the wire or disk that comes with the cage, or hold it in place with two or three rubber bands.

Surrounding the Queen Cage with Bees

Returning to the package, now that the queen cage is in its proper position, spray additional syrup on the screens of the package and wait a few minutes. Remove the lid, and, by estimation, shake a cup or two of bees in the area containing the queen cage. These bees will begin scenting, which, in time, will attract the other bees who will cluster around the queen. At this time, add the fondant candy and the pollen supplements or substitutes on top of the frames of hive body #2; then place the inner cover, deep side down, over this hive body. By reversing the inner cover, room will become available to accommodate the fondant and the pollen substitutes or supplements. Many inner cover rims have an opening in the edge in the shape of a half circle or square, which must be covered or plugged to prevent robber bees from entering the hive.

Hiving the Bees Remaining in the Package

Next, set and center the package on the bottom board surrounded by empty hive body #1. Be sure the entrance reducer is in place; remove the lid from the package and then

place hive body #2 above hive body #1. (Diagram 1) Then invert the sugar syrup feeder over the oblong hole of the inner cover and enclose the syrup with hive body #3. Add the outer cover and secure it by placing a heavy object on top. Spring months tend to be windy.

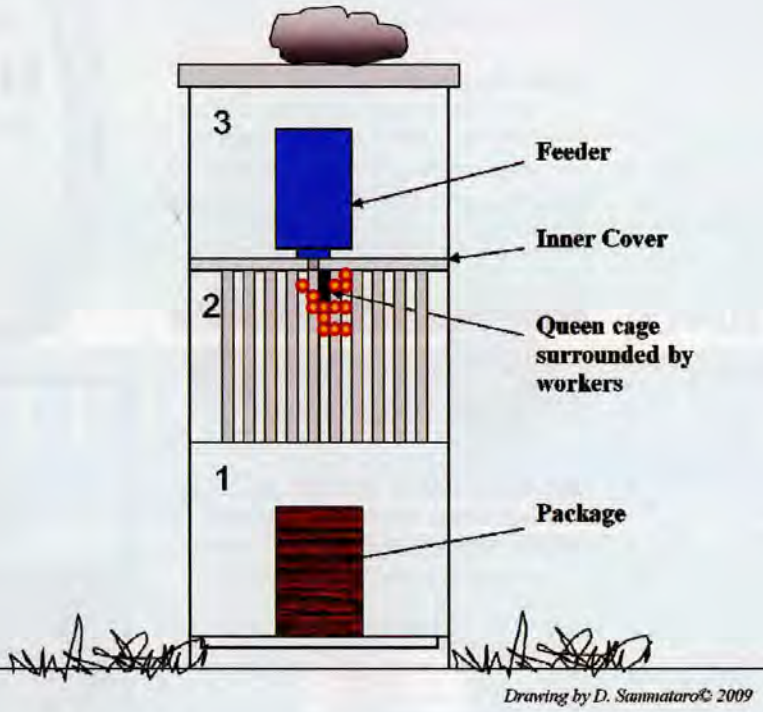
In a day or two, remove the outer cover and the syrup feeder. If necessary, use some smoke to drive back those bees that tend to rise out of the oblong hole once the syrup feeder has been removed. Set hive body#3 on the ground and, using it as a bench, place hive body #2 on top of it. Remove hive body #1 and the empty package, place hive body #2 on the bottom board. Replace the syrup feeder over the oval hole of the inner cover and enclose it with hive body #3 and replace the outer cover. Periodically check the status of the syrup, refilling empty syrup feeders as needed.

Once the bees have been installed, the queen inserted, and food applied, leave the colony alone for three or four days. After that time you must remove the cork from the candy end of the queen cage. Dismantle the feeder hive body, remove the inner cover and gently apply smoke to the area where the queen is located, moving the bees away from the cage. Gently lift the frame with the cage, make sure the queen is alive, and remove the cork. Replace the frames with the cage in place, reassemble the feeder hive body and wait a week or so.

First Inspection

Six or seven days after open the hive and, using smoke as needed, look for eggs and/or larvae. It is not necessary to find the queen if eggs and larvae are in concentrated areas of the comb. If the queen is still in her cage, release her by opening the non-candied passageway. Add additional sugar syrup, fondant candy, pollen supplements or substitutes as needed. When the bees slow their consumption of these added products, one can assume sufficient natural food sources are now in abundance and supplemental feeding is no longer required, but this may be many weeks, especially if they started with foundation. As the hive grows in number and expands, so that bees are occupying most of the frames in the hive, add a second hive body. If this hive body contains comb foundation, it may be necessary to continue to feed the bees sugar syrup in order to stimulate the bees' wax glands.

Hansen Indirect Method



Drawing by D. Sammataro© 2009

Advantages of the Hansen Method

Consider the following:

(1) The hive begins with nine, or maybe ten (10) frames in place. Other methods place the package and a limited number of frames in a hive body, which requires the eventual removal of the package and the insertion of additional frames. Only when the package is removed can a full complement of frames be added.

(2) Drifting is minimized by not having to deposit the contents of the package inside the hive with top off.

(3) The package can be hived at any time of the day, even when it is raining.

(4) A minimal loss of bees.

Disadvantages of the Hansen Method

Consider the following:

(1) The operation requires one to begin with three (3) hive bodies (our modification). Without our modification one can begin with only two (2) hive bodies.

(2) The operation requires juggling and re-positioning hive bodies.

Additional Tips

We continue to be astonished and perplexed to see photographs in a wide variety of bee magazines and books, which display bee colonies in straight lines (often row upon row) all with their entrances facing in the same direction.

Given the fact that bees drift and sometimes enter neighboring colonies for a variety of reasons, and that drifting bees are capable of carrying and transmitting diseases and/or parasites (especially mites), as well as promoting robbing behavior, we

strongly recommend that beekeepers *not* place their colonies in straight lines.

Newly installed packages find themselves in an unfamiliar location. Drifting maybe extensive when colonies are established from packages (Corkins 1933). By placing colonies in a serpentine or circular pattern (Jay 1971) or by painting colonies different colors (Free 1958) helps to prevent drifting. The use of entrance reducers may assist guard bees in defending the entrance to their colony and by reducing the entrance the number of bees exiting the hive at any given time is limited. This may minimize drifting during periods of orientation flights.

Sources in the beekeeping literature suggest that packages should be hived in the late afternoon, about half an hour to an hour before dark, a time of day when flight activities are limited. The rationale is that by the next day the bees will become familiar with their new home and, as they commence foraging, drifting will not take place. BC

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Acknowledgments

We wish to thank Dorothea DeCecco and Jerry and Rene Joyell for reviewing the manuscript, and Robert Rycroft for assisting with its organization. Diagram provided by Dr. Diana Sammataro.

ABF 2010 ORLANDO MEETING

Vice President George Hansen, left, and David Mendes with the Honey Queen and Princess.

The American Beekeeping Federation (ABF) hosted a huge turnout of over 850 people at the North American Beekeeping Conference & Tradeshow, Jan. 12-16, 2010, at the Wyndham Orlando Resort. The conference was billed as the meetings of the ABF and the Canadian Honey Council, but several other industry groups also held meetings during the conference, including the National Honey Packers and Dealers Association, Apiary Inspectors of America, Canadian Association of Professional Apiculturists and American Association of Professional Apiculturists (which held the American Bee Research Conference for scientific presentations).

The theme of the conference was "Keeping the Hive Alive," beginning with the keynote address by Dr. Yves Le Conte, a world-renowned beekeeping scientist from France.

Statistics cited by Dr. Le Conte included: 150-pound honey crops off sunflowers before farmers began using the insecticide Imidacloprid and 60-pound crops and empty (dead) hives afterwards; beekeepers in France were able to have the insecticide Fipronil banned in 2004 and reported improved crops and fewer losses. He also reported that European beekeeping scientists have formed a network to share research information.

A secondary focus of the conference was "keeping honey pure." Jill Clark of Dutch Gold Honey and Customs Investigator Mary Buduris teamed up for an hour-long presentation on the shadowy world of customs fraud and unscrupulous honey dealing. Clark reported that while the U.S. honey market remains strong and U.S. honey production has been declining, recorded imports of pure honey are also declining – facts that she found "a little strange."

Clark estimated that 800 container loads of honey mislabeled as some other product entered the United States in 2009. The products were labeled as honey syrup, blended syrup, malt sweetener, molasses and other products, she said. The advantage to the importer is that the product can be imported from China, but evades the antidumping duty assessed on Chinese honey.

Buduris was joined at the podium by an ICE colleague from Houston. They said they have been working on customs fraud involving honey for nearly two years and indicated that there are ongoing investigations in several other cities.

Liz Vaenoski, center, received the President's Award from Zac Browning, left and Pat Heitkam.

During the ABF Annual Business Meeting, several resolutions dealing with various aspects of honey import fraud and honey adulteration were adopted. A second resolution called for ABF to continue to urge FDA to adopt, as the U.S. Standard of Identity for Honey, the Revised Codex Standard as submitted to the FDA and endorsed by the major industry groups. It also supports state efforts to adopt local honey standards based on the Revised Codex Standard. Florida and California have adopted honey standards and several other states are reportedly working toward adoption of their own honey standards.

During the week-long event, David Mendes of North Fort Meyers, Fla., was elected ABF president and George Hansen of Colton, Ore., was elected vice president. Mendes was previously vice president; Hansen was a long-time member of the Board of Directors. New Directors joining the Board in Orlando are Becky Jones, of Farmington, Conn., and Davey Hackenberg, of Milton, Penn. The full list of the 2010 ABF Board of Directors can be found on the ABF Web site **www.ABFnet.org.**

The ABF also recognized longtime member Liz Vaenoski, of Clinton, Wisconsin, for her outstanding and significant contributions with the 2010 President's Award.

Plans are already in full swing for the 2011 North American Beekeeping Conference & Tradeshow, Jan. 4-11, in Galveston, Texas. The event will be hosted by the ABF and the American Honey Producers Association. Be sure to check the ABF Web site often for the latest conference information. BC

NATURAL REMEDIES

Apricot, Avocado, Absinthe

Abbas Edun

APRICOT

Prunus armeniaca is a deciduous, dicotyledonous tree in the family Rosaceae. Some botanists refer to it as *Armeniaca vulgaris* Lam. Its other names include Aaluka, Mashmash, Peetaalu, Tsiran and Urumaana.

The native territory of apricot is somewhat uncertain because of its extensive prehistoric cultivation, but it is most likely western China or India. It can be found in the area of the northwestern Himalayas, particularly in the valleys of Kashmir, Chenab and Kullu, and on the hills of Simla at an altitude of about 10,000 feet (3,000 m.).

The tree became introduced throughout Asia and Europe, and eventually to South America. It is also grown in Tasmania, western Victoria, New South Wales and South Australia.[1] Armenia's Ararat Valley has a large number of apricot trees; they have been growing there from time immemorial.[2]

Although often thought of as sub-tropical, the tree is genetically diverse and can grow in a wide range of climates.[3] Such diversity occurs in North America, where apricots are produced near Penticton, British Columbia, in northern New York, in southern California, and even near Puebla in Mexico.

The apricot tree is slightly more cold-hardy than the peach and can tolerate Winter temperatures. However, most commercial production is limited to areas where temperatures do not fall below -10 to -20°F (-23 to -29°C) for extended periods. Frost in the Spring limits apricot culture, since it often kills the flowers. The tree tends to flower very early, around the time of the vernal equinox, even in northern locations such as the Great Lakes region.

Since apricot trees require cross-pollination, one should plant two or more varieties to ensure proper fruiting.

Large quantities of vitamins A, B complex and C make the fruits highly nutritious. They also have many essential minerals, including calcium, iron and manganese, and are useful for strengthening the immune system. Their high fiber content allows the dried fruits to help relieve constipation; however, eating too many of them may cause diarrhea. On the other hand, fresh fruits are astringent and can have the opposite effect.

Research indicates that, of all foods, apricots possess the highest levels and widest variety of carotenoids.[4] The kernels, known in traditional Chinese medicine as Xing ren, contain amygdalin, a toxic cyanogenic glycoside that has a sedative effect on the respiratory system.[5] They are mainly used internally as a cough remedy for asthmatics and persons who suffer from bronchitis, and are also considered helpful in regenerating body fluids, in detoxification, and in quenching thirst.

Finely ground kernels are used externally as an exfoliating medium in cosmetic applications. An essential oil extracted from them nourishes and lubricates skin for those very few people who may otherwise have an allergic reaction. It is an effective emollient that contains essential fatty acids, is light weight and easily absorbed into the skin.

AVOCADO

Aguacate, Alligator Pear, Butter Fruit, Midshipman's Butter, Palta and Zaboca are some of the common names of *Persia americana*, a member of the family Lauraceae. That family includes Bay Laurel, Camphor, Cinnamon and Laurier Blanc. The avocado is native to Mexico, Mesoamerica,[6] South America and the Caribbean, and is also known to botanists as *P. gratissima*.

Avocado is widely distributed and is now found in most of the Australian states, southeast Asia, and the southern parts of India and Spain; it also flourishes in Puerto Rico, South Africa and Vietnam.

This evergreen can grow in various environmental conditions and is remarkably adaptable to many types of soil; it does well in such diverse types as sandy or volcanic loam, decomposed granite, red clay and lateritic[9] soils. In southern Florida, avocados are grown on limestone soils with a pH level ranging between 7.2 and 8.3. The trees grow well on hillsides, since their primary requirement is good drainage.

Avocados will grow in shade, but are productive only in full sun. The subtropical species needs a climate with little wind and without frost.

High winds reduce the humidity, dehydrate the flowers, and affect pollination.

Small, greenish-yellow flowers appear in many terminal panicles between January and March; each of them produces one to three fruits. The flowers are perfect, but are either receptive to pollen in the morning and shed it the following afternoon (type A), or are receptive to pollen in the afternoon, and shed it the next morning (type B). Production is best when cross-pollination occurs between types A and B. The flowers attract honey bees and pollination is usually good except during cool weather. Avocado honey is dark in color, with a rich, buttery taste.

The fruits are extremely variable in size, shape, and color. The outer skin may be as thin as paper, or coarse and woody. The flesh is hard when harvested but softens to the consistency of butter with a rich, nutty flavor. It is very green near the skin, and becomes yellowish nearer to the single large, inedible ovoid seed.

Avocado is considered the world's most nutritious fruit because of its high content of vitamins A and K. It also contains small amounts of vitamins B, C and E, and biotin, as well as folate, niacin, riboflavin and thiamin. It is loaded with glutathione, an antioxidant that protects cells from reactive oxygen species such as free radicals and peroxides; it reportedly helps to fight cancer and the aging process. The fruit is also rich in beta-sitosterol, one of several plant sterols highly effective in reducing an enlarged prostate as well as in lowering cholesterol.

Avocado oil contains octocosanol, a fatty alcohol that is common in the epicuticular waxes of plants. Researchers have found that it is useful in improving endurance and increasing oxygen utilization.

Used internally or externally, some believe that avocado is a genuine beauty aid for promoting younger looking skin and healthy hair.

ABSINTHE

Artemisia absinthium, a suffrutescent[11] perennial, is a member of the composite family Asteraceae, and is also known to botanists as *A. vulgare* Gaertn. and *A. o cinale* Lam. Among its common names are Afsanteen, Chernobyl, Green Fairy (or Ginger), Madderwort, Old Woman, Southern Wood, Titween, Wermutkraut and Wormwood.

It grows naturally on uncultivated, arid ground, in cropland, farmyards, and pastures and along the sides of roads. It is naturalized in some areas not too away from central and southern Europe, which is its native range. It was introduced to North America in 1841 and flourishes from British Columbia to Nova Scotia, and south of the border in Oregon, Utah, Colorado, Nebraska and Virginia. In Kashmir it is found at an altitude of 5,000 –7,000 feet (1500 - 2100 m.).

Absinthe is an herbaceous plant with a hard, woody rhizome. The stems are erect, growing up to five feet (1.5 m.) tall, grooved, branched, and silvery-green; lateral branches may extend up to six feet in all directions. The leaves are spirally arranged, greenish-grey above and whitish below; they are covered with silky silvery-white trichomes,[12] and bear minute oil-producing glands.

The tiny, tubular flowers appear in North America between July and September.

Although the flowers are wind pollinated the plant is, nevertheless, of interest to beekeepers. The pungent, offensive scent of the foliage is very effective in repelling some insects. When applied to the skin or clothing, it discourages honey bees from landing and stinging. It will keep wax moths away from stored combs, and a few crushed twigs placed in front of a hive may deter robbers.

The herb contains a volatile, essential oil of variable composition, with alpha- and beta-thujone as the major component. Thujone is a constituent which shows addictive and hallucinogenic activity. It stimulates the brain, is safe in small doses, but is toxic in excess.[15] Other substances present in the oil are anti-inflammatory azulenes, flavonoids, lignans and phenolic acids. The

Absinthe

sesquiterpene lactones (artabasin, absinthin and anabsinthin) exhibit an anti-tumor effect, and are anthelmintic and insecticidal.

Absinthe has been known for centuries as an herbal preparation; it was used therapeutically by Hippocrates.[16] It is an excellent bitter tonic[17] for gastric problems and is also used for dyspeptic complaints and stomach pains. It is also credited with antiseptic, choleretic, diuretic and slightly febrifuge properties, and is effective as a vermifuge and an emmenagogue.[18]

Persons suffering from anorexia nervosa, loss of appetite and chronic acalculous gallbladder disease[19] may find a remedy in absinthe. All parts of the plant are often made into a decoction and used as a wash for skin diseases and ulcerative sores. The leaves are used as a treatment for eczema, epilepsy, gout, herpes, jaundice, kidney stones, purulent scabies and scurvy.

Absinthe should not be used by pregnant women as it is a uterine stimulant which can cause spontaneous abortion. Prolonged use of it may cause insomnia, nausea and vertigo. It should never be given to nursing mothers or to children. It is contraindicated in gastric and duodenal ulcers. Excessive doses may cause severe diarrhea, vomiting, retention of urine and a disturbance of the central nervous system. BC

Abbas Edun has been keeping bees in Onatrio, Canada since 1979.

References

[1]It is cultivated in the Riverland region, and on the Murray River in South Australia.

[2]Apricot is also thought to be native to Armenia. In *Contributions to the Archaeology of Armenia*, ed. Henry Field. 1968, p. 29. Cambridge.

[3]Malatya province in the Eastern Anatolian region of Turkey is well known for its apricot orchards.

[4]Organic pigments that occur naturally in the chloroplasts and chromoplasts of plants. Carotenoids are anti-oxidants that help to prevent heart disease, and protect against cancer.

[5]Cyanogenic glycosides are cyanide compounds that also occur naturally in many plants.

[6]This comprises the countries of Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

[9]Laterite, derived from the Latin word "later" meaning a brick or tile, is a surface formation in hot and wet tropical areas; it is rich in iron and aluminum and develops by intensive and long lasting weathering of the underlying parent rock.

[11]Having a stem that is intermediate between herbaceous and shrubby, becoming partly woody and perennial at the base.

[12]Fine appendages or outgrowths on plants, e.g., hairs, papillae and scales.

[15]A typical traditional dose is three cups daily of a tea made by steeping 2.5 to 4 grams of the leaves in hot water.

[16]Circa 460 - 370 B.C., considered the father of medicine in recognition of his lasting contribution as the founder of the school which is named for him.

[17]The green parts of the plant contain a bitter glycoside called absinthiine.

[18]A choleretic is a drug that increases the volume of secretion of bile from the liver. Emmenagogues are herbs which stimulate blood flow in the pelvic area and the uterus.

[19]Also called biliary dyskinesia, it appears to be caused by muscle defects or other problems in the gallbladder, which interfere with the natural movements required to empty the sac.

What Do We Tell Them?

When talking to people who aren't beekeepers, send the right message with the appropriate information.

Ann Harman

The publicity about CCD and problems of pollination has aroused great interest in the non-beekeeping public. Beekeepers are being asked about the health of their bees, whether they have experienced CCD and if they have encountered the Africanized bee yet. The number of people taking courses in beekeeping given by state and local beekeeping associations continues to grow. Beekeepers are being asked to tell about their experiences by: garden clubs, birding groups, local service organizations, agricultural groups, local community programs, and many other kinds of associations. All of the people belonging to these groups want to hear about the bad news and what is being done about the beekeeping problems. Even young school children have heard that honey bees are in trouble.

Although in the past nobody really thought too much about your being a beekeeper, suddenly you have become the authority on the bee situation. It makes no difference whether you have kept bees for two years or 20 years or more. You are thought of as having the information about the honey bee situation.

Remember that unless there is another beekeeper in the audience, you know more than the people listening to your presentation, even if you are just a newbee. Whether you know it or not, you have become an authority. For a newbee this fact may seem frightening. Suppose someone in the audience asks a question and you don't know the answer. Your answer can be: "The scientists are hard at work and as soon as they find some answers, the beekeepers will know." This is a true statement. It also means you don't have to say you don't know the answer.

The big problem that faces beekeepers asked to give a talk to non-beekeepers is what do these people want to know. What are you gong to tell them in the time allotted to you? First, find out the length of time for your presentation. This is one talk that does need careful planning, probably more so than if you were speaking to a beekeeper association. Plan to fit the time but allow for a question period. And practice at home even if your dog is the only one listening. Perhaps you can find a friend or colleague who will listen to your practice talk. Blank looks or questions asked will give you some good feedback for making changes.

The most important thing to keep in mind is that the people you are speaking to are not beekeepers. You, as a beekeeper, speak beekeeper language. Even terms that seem everyday to you have either no meaning or convey some very strange visions. Words such as "top bars," "supers," "brood box" leave the audience pondering what is meant and missing the point of what you are trying to say. As you are preparing your talk think about alternate words even though in strict beekeeping language they are not descriptive or perhaps even slightly incorrect. Non-beekeepers do know the word "hive." So you can certainly say "I looked in my hive to see if my bees were alive." But to say you "looked down through the top bars" means you did . . . what? No, you do not have time to explain the term.

You might think that showing some photos will help explain such things as top bars. Wait! Are you going n the wrong direction with your presentation? It is not about how you keep bees. At the moment the audience is perfectly happy knowing bees live in a hive. If they wish to know what's in it and what bees do, offer to give another presentation at another time on honey bees, what they do and how you keep them. You have been asked to explain today what problems bees and beekeepers encounter and what the public can do.

I recently spoke to someone who wants to keep bees and so ordered some equipment. When I asked what he bought he said he had a very nice "foundation with a screen and a piece you pull out." Well, a house has a "foundation." That's what you put the house, where you live, on top of. In beekeeper language he bought a "screened bottom board." So you see how easy it can be to confuse a non-beekeeping audience without meaning to.

Next, keep in mind that the people in the organization do not want to become beekeepers. Well, it is possible that one or two may have considered it. Be careful here or your carefully planned presentation can slip off track. If someone mentions the desire to keep bees, either before, during or after your talk, just say you would happy to talk about that another time, perhaps in your own beeyard. Indicate your willingness to give information but at a more appropriate time. Some people do exist that wish to keep bees "to help them." These

people do need guidance since they do not realize that beekeeping may not be their most suitable hobby.

I spoke to such a man. He phoned looking for information. Fortunately I was able to get some answers to my questions. Yes, he thought that beekeeping would be the way to help the bee problems of disappearance and lack of pollination. Since he lived in an apartment he planned to have some hives "at his mother's place; she has a little vegetable garden." Well, mother lived 60 miles away on a couple of acres in suburbia and grew some tomatoes in her little garden. As a beekeeper I am sure you can find some problems with this situation.

Remember that some people are terrified of stinging insects. Some people are not afraid of stings but can't stand creepy crawly things. Some live in cities or suburbia with regulations prohibiting honey bees. Some have a lawn service that cheerfully sprays insecticides. Actually you can use the lawn service in part of your presentation.

No, you do not ignore some aspects of bee life. Explaining that nectar and pollen are food for the bees is important. Your audience does need to know the role of both. (I had one woman enthusiastically explain to me just how bees collected pollen and made it into honey.) Emphasize the need for a varied diet. Humans can relate to that easily. Now you can lead into some of the agricultural problems being faced today, one being the vast acres of a monoculture perhaps providing little or no nourishment for bees. Remember, your audience does not realize that bees cannot use crops such as grains. Some may have heard about the farmers who are growing so much corn for biofuels. There is a useful item for your presentation.

Problems in agriculture can lead into lack of diversity in general. Hedgerows are being cleared for a variety of reasons, strangely enough as part of some organic certifications for crops. Land is being cleared for housing developments producing a mixture of grass and asphalt. Now your audience is becoming more aware of the world about them and can have a better understanding of how to care for it. You can certainly explain that beekeepers are becoming more aware also and are providing better nutrition for their bees.

You will have to include GM (genetically modified) crops and the newer insecticides in your talk. You are sure to have some questions from the audience. Before you plan this part of your presentation and to be prepared for questions you should go to the new website: **http://www.extension.org** where you will find up-to-date, peer-reviewed, trustworthy information. Once you open the site you can put CCD into the search box. Plus, there are links so you can ask a question and receive a reply in this website. It is best to be prepared with some good information rather than report some hearsay.

Yes, your audience wants to know about CCD and just how it has affected your bees. If you are absolutely certain that you have lost colonies that fit the list of symptoms of CCD then by all means tell them. The extension website mentioned before gives the list of symptoms of CCD. But also tell the audience that the scientists have established those certain symptoms but that colonies can die for other reasons. If you want to surprise your audience just say that insects can get diseases, too, just like humans.

It is helpful to introduce *Varroa* mites as a parasite that has killed many colonies not only in the U.S. but also in other parts of the world. Some in the audience have heard that there is "a bug or something eating the bees." No, the audience does not need the life cycle of *Varroa* or exactly how beekeepers monitor for it or have treated it in the past. You can say that a parasite is harming the bees by causing damage to developing bees and transmitting disease. The audience will want to know what is being done about the parasite. Be certain you are up-to-date on *Varroa* but do not overwhelm the audience with very technical details or all of the pesticides beekeepers sometimes use in their hives.

It may be useful to talk about the effects of weather. Many parts of the country have experienced a ferocious winter in 2009-2010. Too much rain in the west. Snow in the southeast. Massive snows in the eastern states. You can explain that beekeepers can lose colonies during Winter months for a variety of reasons and that effects of unusual weather on the environment can be felt in future months. Losing colonies during the Winter, or even the rest of the year, does not necessarily mean massive losses.

Parts of your presentation will need to be added or modified for the particular group you are addressing. Today there is quite a separation between rural groups with farmers and those that are in cities. Such topics as insecticides in the environment and their effects, not only on bees but also on other pollinators, insects and wildlife need to be addressed but with an appropriate approach. Please keep in mind that you are there to give facts, to give the audience something to think about. Then they can make informed decisions about how they can "help the bees."

You see, you can tell the non-beekeeping public about bee and pollination problems without using beekeeping language or teaching them to be beekeepers. Be a good ambassador for honey bees. BC

Ann Harman gives a lot of talks to beekeepers and people who aren't beekeepers.

Make The SIMPLEST HIVE

Peter Sieling

The absolute simplest moveable comb hive may be the most useful piece of equipment you can make. The complete hive is easy to make. It consists of seven components, all straight cuts on a table or radial arm saw – no rabbet or box joints. If you live in a remote area without electricity, say rural Tanzania or Belize, for example, you can make this with a hand saw.

It took me 113 minutes to cut out and assemble one from lumber and plywood. That's less time than it takes me to drive to the nearest beekeeping supply company. You can catch a swarm in the morning, build a hive and install the bees in the afternoon.

But wait! There's more!

The simplest hive is versatile – it's interchangeable with standard Langstroth equipment. You can make the simple frames and let the bees build their own comb or use standard Hoffman frames instead. Put the simple hive on a regular bottom board, or over a super. Use the simple frames adjacent to commercial frames[1].

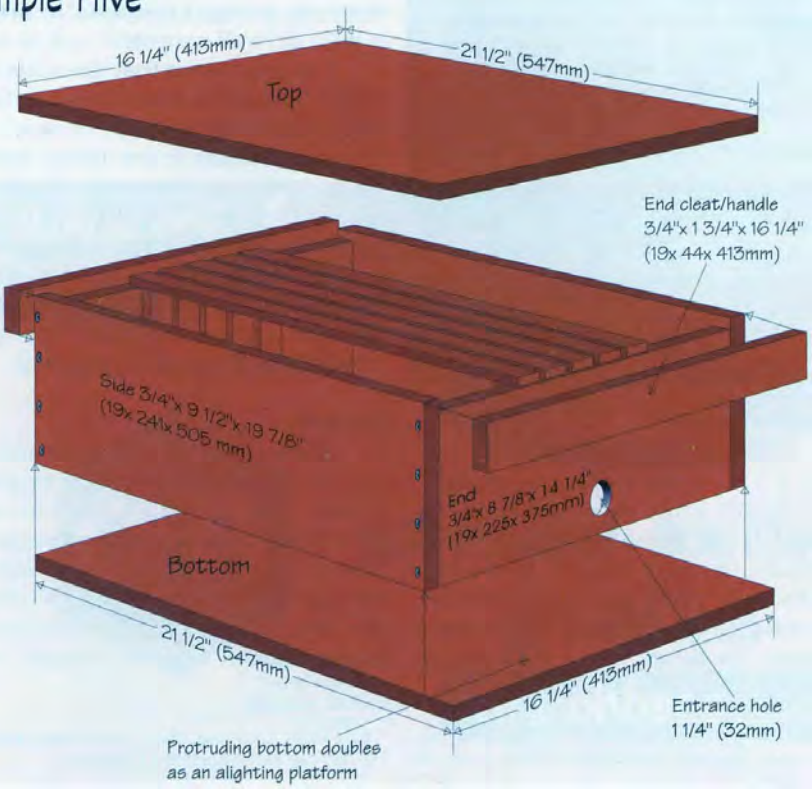
But that's not all!

Because it's inexpensive ($10.00-15.00) and easy to make, you can build several and put them out to attract swarms. The bees will usually, with a little guidance from the beekeeper, build their comb right in the frames, allowing easy transfer from the simple hive to a regular hive (see sidebar).

Best of all!

The simple hive is all you need to start beekeeping without the expense

Simple Hive



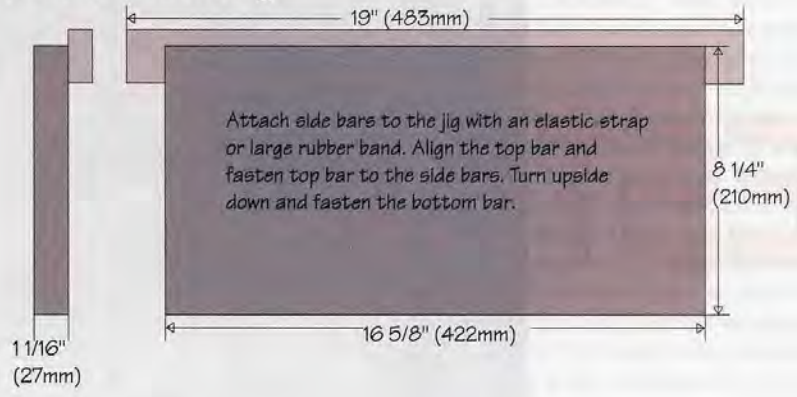
Convincing bees to put their comb in the frames

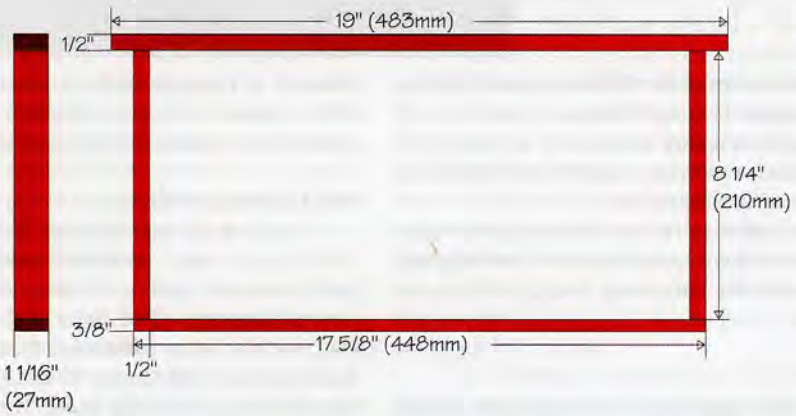
L.L. Langstroth recommends using spare honeycomb, dipping the upper edge in melted wax, then holding the comb in place until it hardens. Foundation is difficult to fasten to top bars. It wants to bend and twist. Cut a saw kerf in the center of the top bar and wedge it in place with wood splinters.

The simplest method I've used doesn't require honeycomb or foundation. Use a piece of beeswax as a crayon and with a straight edge and draw a line down the center of the top bar. The bees will build their comb on the wax line.

[1]Don't mix plastic frames and foundation with no additional wax applied, with wood and wax foundation. The bees will only use bare plastic as a last resort and you may end up with irregular combs.

Frame and Frame Jig





Materials:

Description	Quantity	Size	Metric (mm)
Sides	2	¾" x 9½" x 19-7/8"	19 x 241 x 505
Ends	2	¾" x 8-7/8" x 14¾"	19 x 225 x 375
Cleats	2	¾" x 1¾" x 16¼"	19 x 44 x 413
Top	1	5/8" x 16¼" x 21½"	16 x 413 x 547
Bottom	1	5/8" x 16¼" x 21½"	16 x 413 x 547
Frames			
Top bar	10	½"x 1-1/16" x 19"	13 x 27 x 483
Bottom bar	10	3/8" x 1-1/16" x 17-5/8"	10 x 27 x 448
Side bar	20	½" x 1-1/16" x 8¼"	13 x 27 x 210
Hardware			
drywall screws	24	6 x 2 coarse-thread	
Nails	80	1½"	38

of new beehives and honey processing equipment. You harvest your honey crop the old fashioned way, squeezing honey out of the combs or making cut comb, or comb honey. If you decide to expand your hobby to a business, you can still use the primitive frames for brood. Because they are unwired, you can't extract honey in an extractor. (You may be able to extract unwired frames in a radial extractor.)

Instructions

1. Cut the hive parts from a piece of 1 x 12 x 6 feet of pine or poplar[2]. The length of the sides and ends are based on an actual thickness of ¾" (19mm). If your lumber is thicker or thinner, you'll have to adjust the lengths so the inside dimensions remain the same: 14¾" (375 mm) x 18-3/8" (467 mm).

2. Rip the longer sides to 9½" (241 mm) wide. Rip the shorter ends to 9-1/8" (232 mm) wide.

3. The leftover strips ripped from the sides double as the back of the frame rests and handles. Trim them to length.

4. Nail or screw the box together. Pre-drill to prevent cracking. Countersink for screws. Butt joints depend solely on the strength of the fasteners to hold it together. Neither nails nor screws hold as well going into end grain so use nails or drywall screws at least 2" long.

5. Bore a 1¼" entrance hole. While the entrance on a commercial hive is larger, this entrance size is preferred by swarms looking for homes[3]. You can make a larger entrance by adding 3/8" x ¾" (9 x 19 mm) cleats to the hive bottom.

The resulting box is the same size as a standard commercial box, except for wider frame rests. Like the early hives, there is a bee space around the ends of the top bars.

Top and Bottom

Use exterior grade ½" or 5/8" plywood (13-16 mm) cut to size. You can also use two or three boards of solid lumber trimmed to fit.

Both plywood and solid wood will warp with exposure to sun and rain. The simplest solution is to put a rock or bricks on top of the cover, or fasten it with drywall screws.

You may notice that the space between the frames and top and bottom is less than the 1/4"-3/8" bee space. This compromise in the design makes the simple hive the same depth as standard hives. Commercial hives also violate the bee space by leaving a larger space. The periphery of the hive is the last place the bees will fill, and unless crowded, they may never fill it.

Frames

These simple frames are a bulked up version of Langstroth's original frames. The ½" thick top bar and 3/8" thick bottom bar resist sagging. The ½" thick side bars are easier to nail without splitting. Without the slip joint found on commercial frames, these are more fragile, but

[2]You need a finished width of 9 1/2", so a 1x 10" may work, but most dimensional lumber is only 9 1/4" wide.

[3] Bait Hives for Honey Bees. Information Bulletin No. 187 Cornell Cooperative Extension.

they stiffen up when the bees fill them with comb.

It's a lot faster to align all the frame parts on a jig (see illustration), then nail or staple them together. You can design a better, faster jig but this one is about the simplest.

These free-hanging frames need to be placed carefully in a level hive, 1-3/8" (35mm) on center. I marked the frame positions on the frame rests with a pen to make it easy to align them. Start by marking the center line and one line on each side of that 11/16" (17mm) apart. Next mark lines 1-3/8" apart to the edges. It's easy to center each frame on these lines by eye.

Finishing

Unfinished plywood exposed to the weather can last 10 to 15 years. Painting will increase the life. So can adding aluminum flashing on the cover.

This hive may not be the best hive, but it is the simplest. Used as is, you experience beekeeping similar to the apiarians of 150 years ago – the dawn of the moveable frame hive era. Depending on your woodworking skill, you'll doubtless think of improvements.

For questions, comments, or critiques, contact the author at **petesieling@gmail.com**. BC

Peter Sieling makes the Simple Hive, and more complicated items in his woodshop in New York.

A Honey Of An Exhibit

Janno Daniel Lewis
Dave Tarpy

If you are travelling to North Carolina this Summer to attend EAS, stop by this exceptional exhibit

Gorillas, giraffes, rhinos, . . . and honey bees?! Big and small, these and many other species are thriving in natural habitats at *one* site in North Carolina. More exactly, they are in North America and Africa, two masterfully designed regions at the North Carolina Zoological Park in Asheboro, NC. Asheboro rests in the central Piedmont region of the state, just out of the foothills of the western mountains of the state.

More good news. For those of you planning a state visit to Boone, North Carolina for the EAS (Eastern Apicultural Society) meeting on August 2-6, you would be remiss not to accent a superb event by visiting the state's zoological park. It's recognized as one of the finest and the first, natural habitat, walk-through zoos in the country. The NC Zoo's admirable commitment is conservation, not only of world plant and animal species, but also maintaining species' natural interdependence with their environments including the human visitor.

What about those honey bees? A honey bee exhibit – appropriately named "The Honey Bee Garden" and described by newspapers, visitors, and zoo designers as "one of the zoo's most visited exhibits"- stands within the state zoological park.

The garden features an array of native plantings providing numerous nectar and pollen sources. An open pavilion with its scenic boardwalk crowns the gardens. The structure houses a four-frame, permanent observation hive where clusters of honey bees generate continuous clusters of fascinated viewers. Remember your initial view of a working colony? Imagine the impact it might have on thousands of visitors every year.

Visitors also can walk into a giant, human size-proportioned skep modeled after the traditional European beehive basket. Inside the skep are models of honey bees at work on honeycomb as it would be if found in the wild.

How did this notable achievement for a tiny insect take place in a zoo where the buffalo and antelope roam with zebras and elephants – all giants compared to the honey bee? First and clearly is the significance of honey bees themselves. But in the minds of three master beekeepers who were at a 1994 North Carolina State Beekeepers Association conference – who realized the value of needed, world-wide education for the continuation of the health of the honey bee – something significant needed to be done.

The vision and tribute for the bee

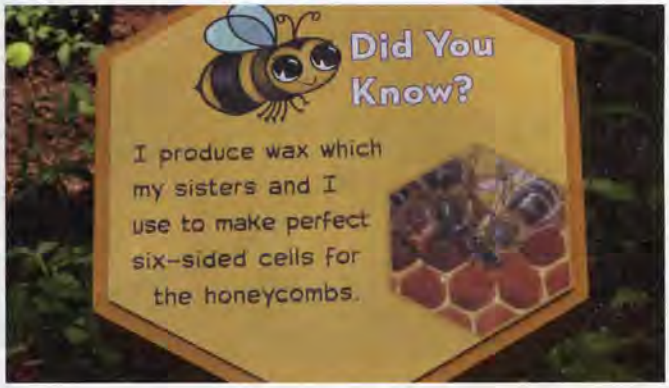


exhibit go to the North Carolina State Beekeepers Association (NCSBA) President, Irvin Rackley; Dr. John Ambrose, former NC State University Extension Apiculturist; and Bill Sheppard, NC Department of Agriculture apiary inspector. Their decision was to approach NC Zoological Park Director, Dr. David Jones, asking him to authorize beekeepers within the NCSBA to begin a program of weekend educational events using a honey bee observation hive at the zoo during the months of April through October.

After observing the beekeeper volunteers among crowds of onlookers at their temporary site, Mr. Rackley ratcheted up to another level. In his gentle but unyielding drive toward a permanent exhibit, he energized the North Carolina State Beekeepers Association membership of 2000-plus saying, "This [temporary plan] was an excellent [program] which attracted push-and-shove crowds who learned much about honey bees and their relatives." In 2002, an already active permanent honey bee exhibit Zoo Committee of beekeepers (led by Rackley) met with Director Jones for a more permanent plan. The director replied with a challenge: IF your state association, led by its committee, can raise $100,000 within one year, THEN this project can go forward. Fifteen heads of supporting beekeepers around the room nodded affirmatively.

NC Farm Bureau, recognizing that "the hardworking honey bee has long been a hero to North Carolina's agriculture,"* partnered with the NC beekeepers in raising funds and lending its strong voice.

Of course, there were some hurdles and construction delays. Almost a decade and a half were yet to come before the resulting valiant efforts of beekeepers, friends of beekeepers, and the NC Farm Bureau were brought to fruition in the December 2007 ground breaking. Praising Chairman Rackley and his zoo committee, Russ Williams, NC Zoo Executive Director stated, "The exhibit will do much to encourage conservation of a fragile resource we depend on every day."

Zoo design teams, beekeepers, and building and landscaping architects all went into high gear. It was June 19, 2009 when Zoo Director Jones in his message to those attending the dedication and ribbon cutting said, "Clearly displayed within the zoological park's Honey Bee Garden is the message that the honey bee, though not a native of North America, has now proven it's worth and begs recognition and all means of survival. Of the one million species of insects now known to mankind, the honey bee is one of the most important insects. In recognition of this remarkable insect, this will be a honey of an exhibit."

From North Carolina beekeepers, we invite you to sweeten up your experiences. Come in August to the beautiful "high county" in Boone for the exceptional EAS conference, where some of the world's most renowned *Apis mellifera* experts will be brushing wings with us all. And while you are in our state, visit the North Carolina Zoological Park and experience the sweet honey bee exhibit.

The NC Zoo opens at 9:00 a.m. 364 days a year, closing only for Christmas Day. Ticket costs are $10 for adults, children 2-12 and senior adults 62 and over $6. Zoo Society Membership and volunteers are discounted. BC

Quote taken from "Creating a Buzz" written by Chris Street in the NC Farm Bureau April 2005 issue.

To Find Out More About EAS 2010 visit
www.easternapiculture.org

Swarm stories

IN ONLY SIX WORDS

Our short story authors came up with some interesting scenarios this month . . . plus, there's a few that aren't exactly swarm stories, but are fun to read. We have two topics for the next go 'round.

Let's try . . .

That Honey Tastes Like . . .

An example would be . . . Butterscotch, on a hot Summer day. Or, Metallic, like a cold, wet spoon.

And the second topic is . . .

The weather last Winter where I was, was so bad . . .

An example would be . . . So cold, the Buzz froze off. Or, Snow so deep, bees used snorkels.

So, crank up your keyboards and send us some more of your great stories.

Honey or Weather, in six words.

Scouts dancing, mother with clipped wings, and
Whose swarm, all hives profess innocence
– *Emmy T., North Greenbush NY*

Bee in veil, big fat lip – *Hank Groth, Hamden NY*

Captured swarm, got paid with honey
– *Joe Gingerich, Sullivan OH*

Grandma banged pots, swarms flew away, and
Grandpa smoked tobacco pipe calming swarm
– *Frank Mitch, Akron OH*

Live in Cary, Can't have bees!
– *Lewis McKenzie, Cary NC*

Asparagus patch. Low, natch. Easy catch
– *Judy Pendergast, Rocky River OH*

Bees free themselves on Independence day, and
Loofah – makeshift screen for cardboard box
– *Selena Creed, Lewiston MI*

Fifty foot cedar. Lower Branch? Hah!
– *Karen Edmundson Bean, Maple Falls WA*

Spigot left open, bottle with shovel
– *Tim Fulton*

Big swarm hanging, forty feet up, and
Swarm starting, air full of bees
– *Dennis Gallagher, Bend OR*

Pulled branch hard, bees on head
– *David White, Kennewick, WA*

Swarm upstages clown at birthday party, and
Ladder wobbles, drop bees on policeman!
– *Bill Hoskins*

I'm definitely going to split tomorrow, and
Always have a spare box ready
– *Ann Zudekoff, Huddleston VA*

Swarm in tree. My mind buzzes, and
Hive for rent. Bees moved out!
– *Pat Thomas, Duluth MN*

Don't position ladder directly under swarm
– *David Anderson, Palmyra PA*

Tall tree. Short ladder. Bye girls
– *Carol Cottrill, Rumford ME*

Dry swarm, no gloves, swollen hands
– *Richard Harris, Sedley VA*

My hive swarmed.
Hived my swarm, and
Swarms high, swarms low, let's go
– *Ann Harman, Flint Hill VA*

Shhh, listen. The bees are swarming, and
Swarm out, swarm in, swarm gone!
– *Matthew, Melanie and Craig Tanis, Pompton Plains NJ*

Scout bees, perfect cavity, new colony
– *Anita Collins*

Swarm settles like rain to grass, and
Nice low limb again, good bees!
– *Sue Garing, Kirkwood NY*

Garden swarms paralize neighbors. Beekeepers rejoice.
– *Russ Aceto*

GLEANINGS

APRIL 2010 • ALL THE NEWS THAT FITS

HONEY MARKET TO PASS 1.9 MILLION TONS BY 2015

The global honey market is forecast to exceed 1.9 million tons by 2015.

A new report by California-based Global Industry Analyst Inc. (GIA) says the market is being primarily driven by increasing awareness levels and health consciousness among the consumers, leading to increasing demand for healthy and natural food products.

In line with the trend, several honey producers are launching new products and varieties at regular intervals. The increasing trend of organic and healthy spreads is expected to continue giving rise to new variants and flavors in the global honey market.

"Increasing preference among consumers for honey-based products, is leading to a boost in the variety and assortment of honey based food products, baby products, yogurts and drinks," the report, which GIA is selling for $3,950, says. "Moreover, honey contains antioxidants, minerals, vitamins and proteins, making itself an appealing ingredient as compared to artificial sweeteners."

Europe and the Asia Pacific, including Japan, dominates the global honey market, the report says but warns the global honey sector is not devoid of any challenges.

Honey bee losses represent one of the major challenges encountered by honey sector worldwide. Honeybees are also susceptible to threats such as environmental stress, pests and diseases, among others. Colony Collapse Disorder (CCD) leading to death and disappearance of honeybees, is another key challenge faced by the global honey sector.

Lately, the U.S. honey sector is facing a steep decline in production volumes triggered by declining number of bee colonies, and increased costs, leading to rising honey prices.

Apart from disease and pests, including colony collapse disorder, the report says calamities such as drought and wildfire also affected the bee production and costs in the recent past. Various macroeconomic factors such as U.S. dollar depreciation and weak economic conditions also led to the price rise in the honey market.

The report says key players dominating the Global Honey Market include Bee Maid, Billy Bee Honey, Capilano Honey, Comvita Ltd., Dabur India Ltd,, Dutch Gold Honey Inc., Golden Acres Honey, Hebei Wuqiao Mtl. Co. Ltd., Odem International Inc., Rowse Honey Ltd, Shriro Pvt. Ltd., Sioux Honey Association and Yanbian Baolixiang Beekeeping Co. Ltd.

The report titled Honey: A Global Strategic Business Report, provides a comprehensive review of industry overview, product overview, product introductions/innovations, profiles of major players, and recent industry activity.

The study analyzes market data and analytics in terms of volume sales for regions including the U.S., Canada, Europe, Asia-Pacific and Latin America.

For more details about this comprehensive market research report, visit - **http://www.strategyr.com/Honey_Market_Report.asp**

Alan Harman

BEES WARN HIVE OF DANGEROUS SITUATIONS

Honey bees warn their nest mates about dangers they encounter while feeding with a special signal that's akin to a "stop" sign for bees.

Biologist James Nieh, an associate professor of biology at University of California San Diego, says the stop sign is a brief vibrating signal made by the bee that lasts for about a tenth of a second with the bee vibrating at about 380 times a second.

"It is frequently delivered by a sender butting her head into a recipient, although the sender may also climb on top of the receiver," Nieh says.

Researchers originally called it a "begging call," because they believed the signaling bee made it to obtain a food sample from the receiver.

Nieh's discovery, detailed in a paper in the journal Current Biology, results from a series of experiments on honey bees foraging for food that were attacked by competitors from nearby colonies fighting for food at an experimental feeder.

The bees that were attacked then produced a specific signal to stop nest mates who were recruiting others for this dangerous location. Honey bees use a waggle dance to communicate the location of food and other resources. Attacked bees directed "stop" signals at nest mates waggle dancing for the dangerous location.

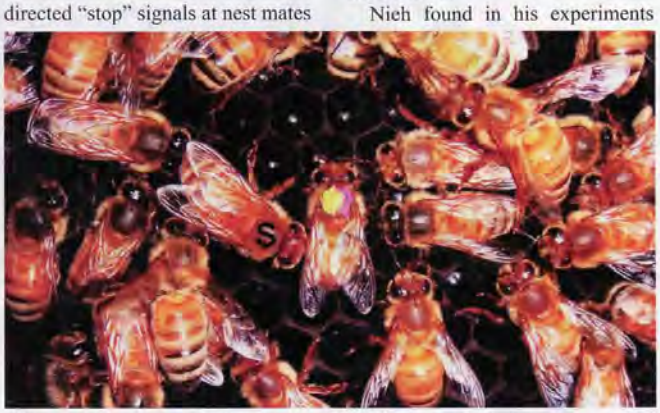
Nieh says peculiar signal in bee communication was known previously by scientists to reduce waggle dancing and recruitment to food, but until now no one had firmly established a "clear natural trigger" for that behavior.

He discovered in his experiments that one trigger for this signal – which caused the waggle dancers to stop and leave the nest – was attacks from bee competitors and simulated predators. The more dangerous the predator or competitor, he found, the more the stop signals bees produced to stop other bees from recruiting to that location.

"This signal is directed at bees who are recruiting for the dangerous food location and decreases their recruitment," Nieh says. "Thus, fewer nest mates go to the dangerous food site.

"This is important because an individual experiences danger and stops recruiting, but the stop signal enables her to 'warn' nest mates who have not yet experienced danger and are still recruiting. The end result is that the colony will reduce or cease recruitment to the dangerous food patch in proportion to the danger experienced."

Nieh found in his experiments



The waggle dancer (at center with yellow and pink paint marks) is frozen when receiving a stop signal from a bee marked "S" to her left. (photo by James Nieh)

Continued on Page 75

70 TONS OF MANUKA HONEY LOST IN 10-HOUR FIRE

Some 70 tons of high grade manuka honey due to be exported from New Zealand was destroyed in a 10-hour fire in a loss estimated to have cost Kiwi Honey Ltd. almost NZ$1 million.

When firefighters arrived at the scene in Wanganui some 125 miles from Wellington on the North Island, one storage shed was on fire and then a second shed caught fire and was destroyed.

It is believed the fire was caused by an electrical fault.

Company owner Paul Sergent tells reporters the company had lost up to a third of its honey, as well as his sheds full of processing and storage equipment.

The company had been in the process of collecting the honey for a large export order to Japan. It was just two days into extracting honey from the hive frames, which were stored in the destroyed buildings.

The Wanganui Chronicle newspaper reports offers of help have been pouring in for the manuka honey factory.

"We're rebuilding," Sergent tells the newspaper. "We're going to have to start from scratch."

Sergent says there is still 150 tonnes of honey left to harvest but now there is nowhere to process it.

"Most of the honey has been produced and is sitting on hives, and we still have areas that are producing. So the honey wasn't all in the shed.

Sergent says he's grateful to other honey producers who have offered to help extract and process the honey.

– Alan Harman

SITUATIONS ... Cont. From Page 73

that during aggressive food competition, attack victims significantly increased their production of stop signals to nest mates, some by more than 40 times.

Bees foraging for food that attacked other bees or experienced no aggression did not produce stop signals. But bees exposed to a "bee alarm pheromone" increased their stop signalling by an average of 14 times. Those whose legs were mechanically pinched in a simulated bite increased their stop signals by an average of 88 times.

Nieh says co-operation within and between cells in an organism relies upon positive and negative feedback. "Superorganisms," such as honey bees, are like a multi-cellular organism because each individual bee, just like a body cell, acts for the good of the whole, the colony. Superorganisms use many types of positive feedback signals, but there are few known examples of negative feedback signals.

What's interesting to biologists about the discovery of the stop sign, Nieh says, is it's an example of a negative feedback, in which the colony's actions are stopped for the good of the colony.

"This is only the second example of a negative feedback signal ever found in a superorganism and is perhaps the most sophisticated example known," he says. *– Alan Harman*

2010 INSTRUMENTAL INSEMINATION THREE DAY COURSE

Join Dr. Joseph Latshaw September 8-10 for his second annual instrumental insemination course. This course is designed to help individuals learn the science of instrumental insemination and the art of perfecting this valuable technique. The course will be limited to six participants to maximize the benefits of a small group setting. Ample opportunities for individualized instruction and plenty of practice will be provided.

Dr. Latshaw has over 20 years of beekeeping experience and specializes in the design and production of instrumental insemination equipment. Dr. Latshaw has designed two insemination devices – the Latshaw Instrument and the new Latshaw Micro Instrument. Dr. Latshaw's insemination skills and his extensive background in honey bee genetics have allowed him to significantly contribute to the beekeeping community by providing exceptional breeder stock to commercial queen and honey producers across the United States.

Dr. Latshaw has hundreds of hours of teaching experience, and he is a frequently sought after speaker. Join him for this great opportunity to learn the instrumental inseminaiton technique. Applications are required. Enrollment will be closed when the course is full. Please visit **www.LatshawApiaries.com** for additional information and an application.

MUSSEN WINS CALIFORNIA AWARD

University of CA apiculturist Eric Mussen, considered one of the most respected and influential professional apiculturists in the nation, is the winner of the statewide 2010 Pedro Ilic Outstanding Agricultural Educator Award for his work in educating the agricultural community, the beekeeping industry and the general public about honey bees.

Mussen received the award, which honors Pedro Ilic, a Fresno County small-scale farm advisor who died in 1994, March 1 at the CA Small Farm Conference in San Diego.

Mussen and Ilic worked together as members of the Small Farm Work Group in serving the statewide, broad-based agricultural community, say nominators Larry Godfrey, Extension specialist with the UC Davis Department of Entomology, and Michael Parrella, professor and chair of the department.

"They were alike in many ways: their dedication, enthusiasm, high energy, friendliness, their commitment to small-scale and family farming, and the easy-going way they imparted information on a diversity of projects, solving a multitude of problems-and sometimes at a moment's notice," Godfrey says.

Since 1976, he has also written "Bee Briefs," addressing such issues as diseases, pesticides and swarms.

"Eric is a worldwide authority on honey bees, but no problem is too small and no question too involved for him to answer," Godfrey says. "He devotes his research and extension activities to the improvement of honey bee health and honey bee colony management practices.

"Eric helps growers, consumers, UC farm advisors, agricultural commissioners, scientists, beekeepers, researchers, pesticide regulators, 4-H'ers, and state and national agricultural and apicultural organizations. He ignites their interest in maintaining the health of bees, cultivates their friendship, and generously gives of his time and intellect."

Godfrey says with the decline of the honey bee population and the increase of the mysterious colony collapse disorder, his expertise is now more highly sought than ever.

"Any threat to honey bees is a threat to agriculture and a cause for his concern and a desire to assist," he says. "He is the only Extension apiculturist in the UC system and in many regards, functions as the Extension entomologist for apiculture in the western U.S. and indeed, much of the country."

Mussen served last year as president of the Western Apicultural Society, an organization he helped found in 1977. He delivered the keynote addresses at the 2009 CA State Beekeepers' Association (CSBA) and the 2009 American Honey Producers' Association conventions.

He provides leadership in CSBA, the CA Bee Breeders' Association, CA Farm Bureau Federation, American Honey Producers' Association, National Honey Board, American Beekeeping Federation, American Association of Professional Apiculturists, and the Northern CA Entomology Society, among others.

"He is just as open to answering a question about Nosema to a beginner or responding to a question about queen bees as he is to helping a commercial beekeeper with 15,000 hives, or engaging in intricate scientific research," Godrey says.

Mussen offers input to the Department of Pesticide Regulation, particularly with the pesticide registration group. He assisted U.S. beekeepers in writing letters to receive compensation from the USDA for their colony collapse disorder bee losses.

– Alan Harman

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INNER ... Cont. From Page 16

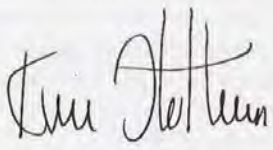
tors representing local districts came and spoke too. As you might imagine, some were well informed, concerned, and truly want to help, while others were blatantly political. I'm always amused when a politician attempts to talk shop with folks who have forgotten more about the topic at hand than the politician will ever know. They end up sounding foolish. it destroys their credibility immediately, and tarnishes politicians in general. It's too bad we are paying them so much to do so poorly...but this isn't new.

A show of hands at the very beginning, when everybody was in the auditorium indicated that somewhere between a third and half were really, really new at this, with a year or less under their collective belts. As a result, the vendors were overwhelmed with both orders and questions, which for most of them is exactly why they came. The times between classes were wonderfully crowded, with people two or three deep and six or seven across at nearly every booth.

I've made most of these meeting over the last 24 years (this was the 32nd year this meeting has been held)...I've watched families mature, children grow, businesses begin and thrive, and some gradually retire. My first meeting was in 1986 when John Root, then the editor here, and I attended. There were about 150 people at that meeting and they were thrilled with the turnout. Richard Taylor was the guest speaker.

This enthusiasm bodes well for Ohio beekeeping. In 1986 Ohio had just over 9,000 beekeepers...then Varroa hit. We dropped to just under 3,000 and stayed near there for several years. They've been gaining the past few years, and I suspect they'll grow to over 5,000 this year. That's a good thing in anybody's book.

It's April, and it's spring almost everywhere (hang on Maine, it's coming), but Spring hit Ohio beekeeping on that sunny, cool and fantastic first weekend in March. And a thousand people came to welcome it back.



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At The Colorado Meeting

Ed Colby

At the Colorado Beekeepers' meeting in Longmont in December, the conference center provided coffee, tea and honey. The tea was a classy brand called "Tazo." The honey came in little plastic packets. They did not state a country of origin. I could tell you the name of the food distributor on the packet.

I took two packets with my tea and sat down next to Tom. I split one open. How could anything taste so vile? I threw a dollar bill and the other packet on the table in front of Tom and said, "I'll give you a dollar to eat the whole thing."

Tom said, "You can have it back if I don't have to!"

A few minutes later, I noticed him smiling and slipping my dollar bill into his wallet. "You ate that?" I said.

"I put it in my coffee," he said.

I meant for him to eat the honey straight out of the packet to earn his dollar, but still, I had to admire his courage.

Pat from Steamboat Springs rolled into the meeting a little late, after shaking down the slots in Central City. Down $1,500 and nearly broke at one point, he rallied and walked away a thousand bucks to the good.

That evening at the bar, we talked about honey bee protein supplements. I said, "I buy the bulk bags and mix my own, because it's so hard to get the paper wrappers off the patties."

Derrick said, "What are you talking about?"

I said, "Well, I take the wrapper off one side of the patties, so the bees can get to it."

Pat said, "You don't have to. That's what those little holes are for. The bees eat right through the paper."

Suddenly a whole table of beekeepers was having a laugh at my expense. But gentle reader, I'd rather have egg on my face than keep doing everything backwards for the rest of my life.

A few days later I rode the Aspen Mountain gondola with a skier who runs the movie theater in Steamboat. I asked if he knew Pat. "Sure," he said. "I buy his honey. And we play poker."

Gambling is a mystery to me. I don't have the instincts for it. I used to like to play poker, and the other players at the table liked it when I played, too.

Pat intrigues me. He works fulltime at the supermarket and runs 900 hives on the side – when he's not running the table. Where does any human being get this kind of energy?

Our keynote speaker was Dr. Malcolm Sanford, retired extension entomologist and professor emeritus at the University of Florida. You might know him as the publisher of the APIS newsletter and a regular contributor to *Bee Culture*.

In his spare time, Dr. Sanford acts in community plays, dances the tango, and writes prolifically about bees. A former Peace Corps volunteer, he is fluent in Spanish and dabbles in French and Italian. He has a great sense of humor. He reminds me of Pat: How can anyone do so much?

Dr. Sanford spoke at length about the abuse of hive chemicals. He is a strong advocate of burning, rather than treating, American Foulbrood-infected colonies. But how many beekeepers actually do this?

He spoke of the loss of Terramycin as an effective antibiotic and the current use of Tylan as a prophylactic in patties, with the inevitable resistance to Tylan that this will bring. Then there's all that illegal stuff . . .

Beekeepers listening to a lecture on hive chemicals remind me of high school kids getting lectured on underage drinking. They look like little angels sitting there in the auditorium. Then on Saturday night they go out and do what teens do.

Even the manufacturers are looking past their short-term profits to warn of the dangers of chemical abuse. Just look at the effective hive tools we've lost already: Terramycin, gone. Apistan, gone. Checkmite, gone – at least for *Varroa*.

There was a hue and cry from American beekeepers about chloramphenicol in Chinese honey, but what about our own product? Is it what we represent it to be? Are we hypocrites to point fingers?

Remember the Alar scare? It nearly sank the American apple industry 20 years ago. Alar is a plant growth regulator with suspected but unproven links to cancer. In the late 1980s, after the EPA classified Alar as a "probable human carcinogen," CBS 60 minutes ran an expose, and grocery stores nationwide refused to sell Alar-treated fruit. Apple growers found themselves with no market. Adding to the scandal, testing revealed that many growers who pledged to stop applying Alar actually continued to use it.

The public, which had largely regarded apples as a healthy food, came to view them as unsafe to eat.

From the apple growers' economic point of view, it didn't really matter if Alar causes cancer or not. Once the public became alarmed, the damage was done.

Consumers look at honey as a safe, natural food. What could be better for you than honey?

OK, occasionally a customer asks if my honey is "organic." I say, "No. I can't guarantee my bees don't fly onto sprayed fields. How could I?" End of discussion.

More frequently, people inquire if my honey is "raw," although they often have no clear idea what that means.

No one has ever asked me about chemicals in the hive – not yet.

At an El Salvadoran restaurant the other night, my server put it succinctly: "Honey is a gift from God," she said. "It's the purest food."

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