Bee Culture
THE MAGAZINE OF AMERICAN BEEKEEPING

MARCH 2002 VOLUME 130 NUMBER 3

FEATURES

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Avocadoes have been in the news lately. Entire orchard crops are being stolen by avocado rustlers and the National Honey Board features Avocado honey in their new brochure. This is where it all begins.
photo by B.A. Underwood

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KEEP IN TOUCH

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MAILBOX

Political Philosophy

I was very much interested in the article by Dr. Mark Winston in the January issue of *Bee Culture*. His reference to the political philosophy of Jeremy Bentham gave me cause, as a conservative, to take a second critical look.

As you may know, the philosophies of two English lawyers (philosophers) were a heavy part of the debates at the Constitutional convention in 1787 Blackstone was a professor of law at Oxford. Bentham was a student.

Blackstone published four books on English Law. These were best sellers in Colonial America. His basic philosophy was " prohibitions on government, not prohibitions from government " Bentham's philosophy was outlined in an anonymous essay 'A Fragment on Government,' dated 1776. His basic philosophy, which was in direct conflict with Blackstone's thinking, was to enhance the Government's position in promoting the common good over the rights of the individual. Their thinking and the debates that followed in Colonial America certainly influenced the final decision at the Constitutional Convention. Today, the ghosts of Bentham and Blackstone walk the Halls of Congress day in, day out, but seemingly nothing is finally resolved – instead we get brightly-colored band aids.

Bentham's philosophy prevailed in 1934 when the German Reichstag and the U.S. Congress gave unlimited legislative authority to the Executive Branch. In Germany complete dictatorship became a fact over night. In the U.S. the change is gradual and will probably continue for many years to come. Conservatives feel that a limit on doing good for society, for whatever reason, must be firmly established, or we, in America may at some future date, face some type of dictatorship.

Dr. Winston invoked the Bentham philosophy three times in his article, The Bee Act:

1. Canadians . . . are more comfortable when their provisional and Federal legislators pass laws and regulations that put the common good before the individual rights.
2. The regulations favor the common good .
3. This is an excellent example of the Canadian balance between individual freedom and the communal good.

I have doubts that Dr. Winston and I would vote the same way. I write you for no particular reason other than a little friendly rapping.

Glenn Gibson
Minco, OK

Double Screen Boards

Have you ever left the outer cover ajar without knowing it? A double screen board keeps other hives from robbing. You can leave the top higher for ventilation than before because there is no chance of robbing. The bees can't glue down the outer cover. Just thought I'd try to help make the job easier for some others. I really enjoy the tips from others. Some of them have some great ideas.

Frank Chamberlin
Asheboro, NC

Harvey & Jean York - Classics

Tick, tick, tick.

You can pump the pedal, but brakes won't stop time.

But when I saw Pat York walking in front of her Orange Street home, I tapped the brakes and aimed for the curb. "How's your mom?" I asked.

"She just left walking home with Pam," she said.

Luckily, the light was green so I could make a quick left turn.

When the arm-in-arm mother and daughter heard the crunching gravel, they stopped and turned around.

All through the impromptu driveway reunion, I pumped an imaginary brake. I wanted to scream, "*Stop, stop, stop!*"

Too late.

A few weeks ago, Jean York's doctor uttered the unexpected word – cancer.

Age and illness continue to hammer my mother and late father's friends, the ones Tom Brokaw calls "The Greatest Generation." Selfishly, I don't want to keep losing them. You want your heroes to live forever.

"How's Harvey?" I asked.

Chuckling, Jean said, "He's taking his nap." He, too, has health challenges.

To me, Harvey and Jean York are one of our community's most engaging couples. Their low-key style would fool a stranger. But to know them is to revel in fascinating conversation. To say they are well-read is an understatement. Whether it's about politics, agriculture, literature, technology, cuisine, travel, Wall Street or whatever, the Yorks can delight you with information.

Harvey was the first person I knew who owned a computer. It was as big as one of his Dodge trucks. Today's replacement is palm-sized.

And I love Harvey and Jean's humor. There she was Sunday afternoon in her back yard in a gown and a jacket courageously laughing and just being Jean. With a mischievous smile, she punctuated her words with wit. When she's on a roll, her funny retorts out-crack Zorro's whip.

Subtle, Jean's commentary is not.

But Harvey is *another story.*

If they were baseball pitchers, Jean would hurl fastballs and an occasional curve. Harvey would baffle you with knuckleballs. His humor dances and floats across the plate. But both leave you laughing.

If they'd been looking out their window 45 years ago, they would have been laughing at me. On the way home from Orange Street

Elementary, my third-grade curiosity took me too close to their Bay Street beehives.

Years later, I got to know the man behind those swarming bees. When James Harper retired from the board of directors of American National Bank, I became the rookie rider with Harvey and Dr. John Wolfe Sr. as we traveled to the Brunswick. Despite the difference in our ages, there's no gap between Harvey, Doc and me. That's the way it is with friends.

In those talks, I learned why the bee industry, worldwide, looks to Harvey for insight and leadership. Dependability and integrity are hallmarks of York Bee Company. Harvey's rudder runs deep. He will stay the course.

Harvey and Jean York are classics.

They're much to humble to consider themselves as regal, but I know better.

Long live the King of Bees.

And *his queen.*

written by Dink Nesmith, Chairman of the Jesup, Georgia *Press-Sentinel*

Where The Bees Aren't?

Jim Thompson & Kim Flottum

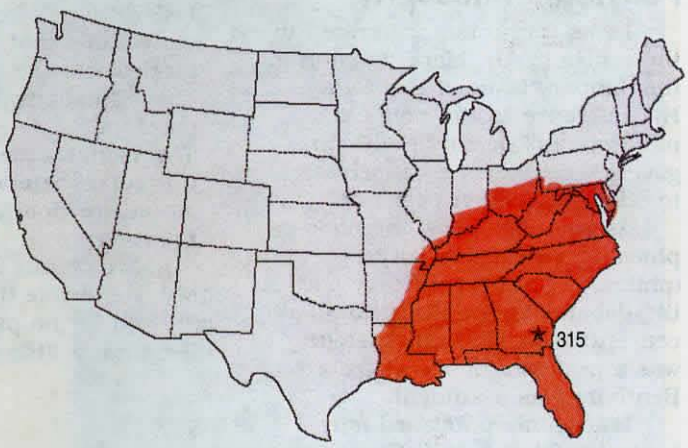
By now you have probably figured out that getting package bees by mail this year isn't a simple phone call away. Restricting packages shipped to a Zone 4 limit, with significant and serious consequences Past Zone 4, makes getting bees in some parts of the country impossible.

If you haven't already, call your shipper. The maps detail the Zone 4 range from various popular locations. Other areas exist certainly, but we've chosen several that are common.

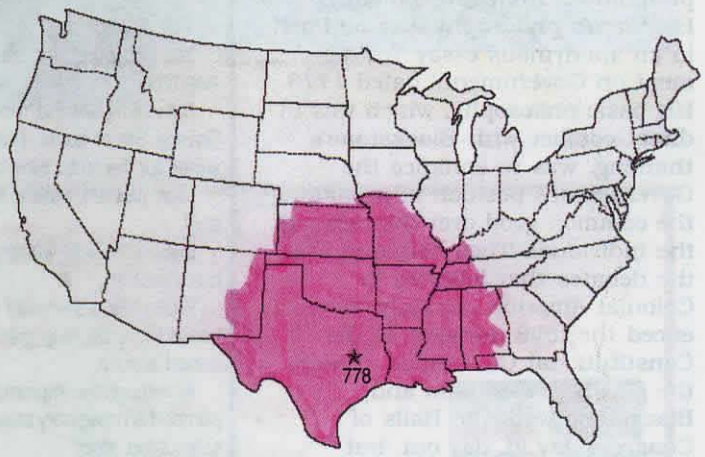
Need bees? Find a local distributor who is making the trip, a local nuc producer, or consider making splits this Spring.

Of course you could move and avoid all this inconvenience. Warmer Winters, longer Summers and all the bees you could want, just a phone call away.

Zone 4 From Baxley & Jesup, Georgia

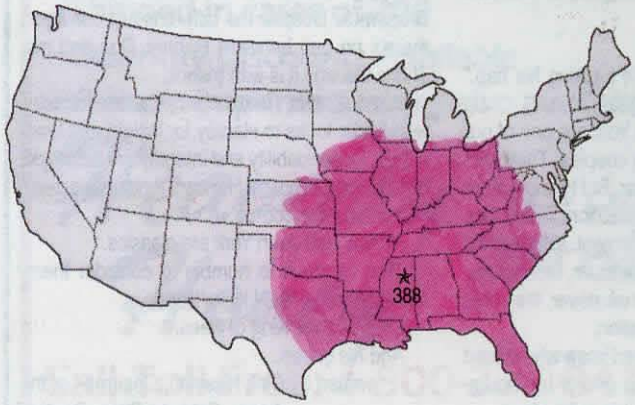


Zone 4 From Navasota, Texas

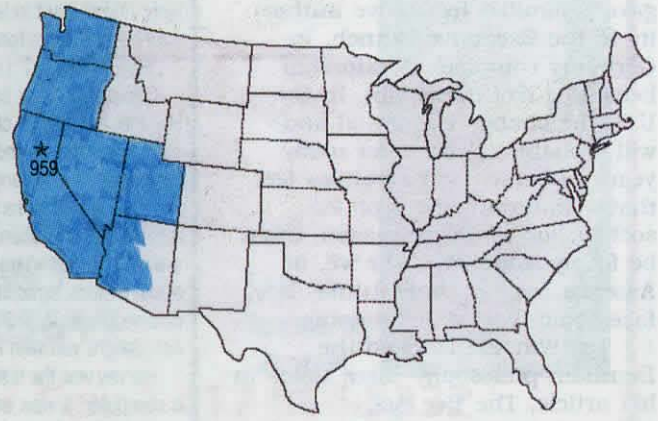


Zone 4 From Moreauville, Louisiana

Zone 4 From Shannon, Mississippi



Zone 4 From Orland, California



INNER COVER

Last year Dr. Bob Danka, USDA ARS Research Scientist at Baton Rouge established a service, working with Ed Holcombe in Tennessee, to test the tracheal mite resistance of the progeny of breeder queens.

Here's how it works. A breeder will send a frame, or frames, of sealed brood all from a single breeder queen to Mr. Holcombe, who places them in an incubator to let workers emerge. At the same time he places a frame obtained from a line of bees with known resistance, and a frame from a line of bees with known susceptibility.

Within a day or so, 40 to 50 emerged bees from each line – resistant, susceptible and test – are marked and placed in a colony known to be infested with mites. Another few days pass and all the marked bees are harvested and examined for mite infestation. About 30 bees from each are tested for percent infested, and for the average number of mites/bee/sample.

Samples from the resistant and susceptible lines are continuously monitored by the folks at Baton Rouge, and even Mr. Holcombe's results are verified to make sure that the testing procedure remains both constant and accurate.

The test costs a queen producer $100, and for that they find out if the queens they are producing are producing bees resistant to tracheal mites. Only $100.

Last Winter a lot of bees died. Bad weather was a culprit certainly. *Varroa* contributed to this, as did, probably, AFB resistant to Terra. But tracheal mites played a big role too. No, I didn't examine bees from around the country, but I did talk to a lot of beekeepers who explained symptoms of tracheal mite infestations. Moreover, a recent test found that 20%, that's 20% of the queens, that's queens they purchased were infested with tracheal mites. What does that tell you about resistant stock?

Bees resistant to tracheal mites exist. They are hard to find, and lots more are supposed to be resistant than actually are I suspect. Last Winter supports that conclusion.

So. When you are ordering queens this year I urge you to ask the producer if they have taken advantage of the service Mr. Holcombe is performing. Then, ask what the results were. If they aren't working to get mite resistance in their lines, find someone who is.

Selecting for mite resistance isn't easy, but it isn't terribly difficult either. And, it costs a bit to run a program that produces mite-resistant bees. But *NOT* having to treat, and *NOT* having to worry about tracheal mites is worth a bit, right?

This year, protect yourself from this tiny beast. Get bees that won't succumb. That won't die from tracheal mites. Start demanding a quality product. Or find someone who will sell you one.

•

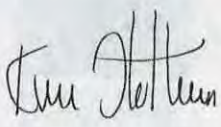
In the Gleanings section, in the back, there's a newspaper story about Chinese garlic. Did you know garlic came here from China? Probably not. And bulk cloves don't come marked "Grown In America" I'm guessing a lot of produce in grocery stores is the same. As are a lot of things we buy.

But maybe it's time we actively practice what we preach. We expect average consumers to 'want' U.S. honey. And we are prepared to offer information on why U.S. honey is better than other honey. Particularly honey from China. Another article in the Gleanings section sort of reinforces that idea. The EU has stopped buying Chinese honey because of a residue problem. (One wonders why the Chinese were sending contaminated honey to the EU only. Apparently none made it here.)

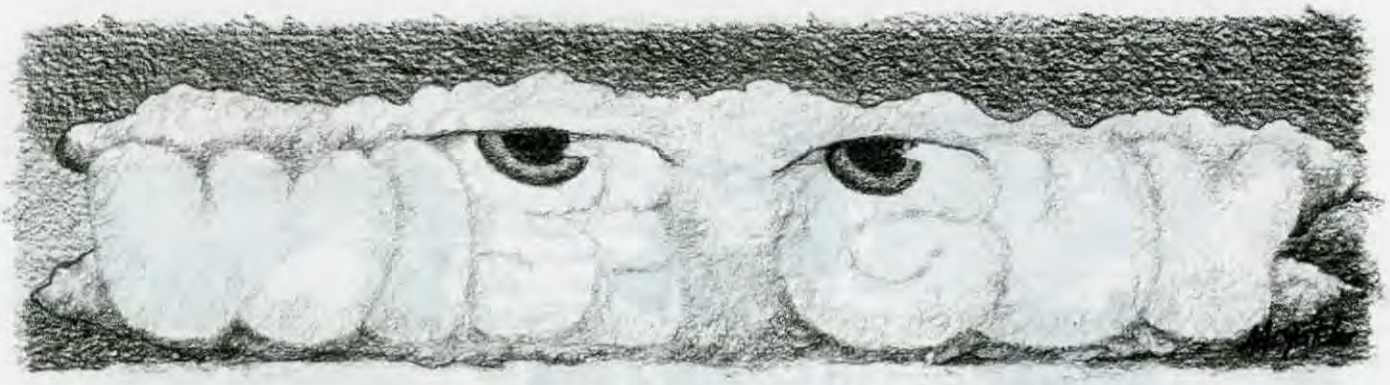
But if we expect behavior from one group of people it's only right that they expect the same from us, right? Where does all the stuff we buy come from, really? Too often it's difficult or impossible to tell where something was made. Sometimes it's obvious. So if given a choice, what is the deciding factor on which product we buy....imported or U.S.? With Chinese honey it has always been price, not quality. Price drove the bargain. Price made the deal. Price, price, price. What price, I ask those who bring this stuff in, for contaminated honey?

I'm not naive enough to believe that if we all start choosing Made In America products we'll make a difference. Wal-Mart, K-Mart and all the rest will still continue selling price. But we have to start. Or at least I do.

It's March. Swarmtime already in some places. Almost there in the rest. Make sure your hive tool's sharp and your smoker's lit. You're already behind.



Better Bees.
Made In The USA!



Doubters, now is the time to blow your trumpets, because I think I may have been wrong! I may have made a mistake! In an earlier article I wrote that I thought that Sioux Honey Company would in the near future get enough new members to control 50% of the domestic production. I now believe that is incorrect. I now believe the percentage will be much higher! The reason for this is after listening to the new members at the conventions the pluses of being a member outweigh the negatives. The largest plus is you have a market for your product. You don't get phone calls that say "Yes, I want your whole crop." But when you ask "At what price?" the answer is, "I'll be fair and pay you the going price when it is picked up." You then ask "When do you expect to pick up the first load because my warehouse is full and I need the room?" The answer is "I should have a truck out there in the next two weeks." You desperately ask "What do you think the price will be?" The answer is "I'll pay you what everyone else is getting at the time we pick it up. This honey market changes day to day and week to week." Two weeks come and go, three weeks come and go and no one has picked up your honey, and of course you have no money either. Then five weeks after the first call a truck picks up your honey (first load) and two weeks later the buyer calls and says that the honey they picked up doesn't match your samples. It is darker. We can't pay you the average price. We will have to pay you 5¢ less per pound. Or, he says, the truck that picked up your honey came in here with no tarp on and I am docking you 5¢ per pound. Your answer to that should be that he hired the truck, take it off of his freight bill. But that seldom works.

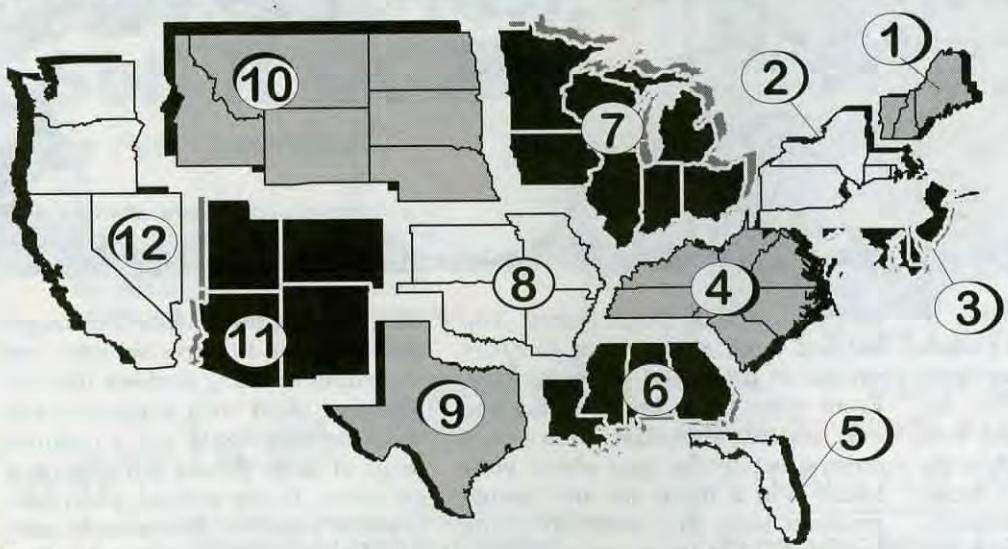
From my understanding none of this occurs with Sioux Honey. You do not need extra room to store drums or processed honey or wax. From what I can tell they are the only organization that gives you a data sheet telling you about your honey and if there are any foreign products in it. They take care of the trucking to get your honey to their plant letting you concentrate on producing honey, not stacking it and trying to sell it. Why does Sioux Honey work with, and for producers? Simply, because they are owned by the producers.

It you look at independent packers today, many started as beekeepers and moved into the packing business. Why? Maybe because they received the same treatment from packers we are receiving from them today. At least some appear to have forgotten where they came from.

I think the change will come fast and part of the reason for that is because our industry (honey producers) is growing old with few signs of a youth movement. The only way anyone extends credit today is based upon an existing market to sell your honey in (which a Sioux Honey membership is) and not simply selling on the spot market. Sioux certainly appears committed to the domestic producer, while most independent packers are committed to price. Within three weeks of the victory in the antidumping case many of the larger independent, American packers were given a free trip to Mexico to influence them buying Mexican honey. Even some of those that claim they pack only American honey went. They were looking for price, or a vacation.

Independent honey producers need to move. We need to join Sioux Honey or consider selling our honey in large blocks. If you have 350 to 500 drums of honey to market, in most cases, you'll have much less bargaining power than the larger producer due to sheer volume. And according to many packers the reason they dealt with Argentina was because they could get a commitment of large blocks of honey at a set price. If five modest sized beekeepers, with 300 drums each, marketed their honey together I believe their marketing power would increase. Your volume would increase from five loads to 25 loads of honey and now you represent a large block of honey. If you continue to market ony what you produce it takes the same approach as lions when hunting their prey. They work to separate a single, small, old or weak animal from the herd to kill. But their prey know as a group they can control the lion and reduce the risk to individuals. But when one is singled out that individual is lost. Don't allow yourself to be singled out. BC

MARCH – REGIONAL HONEY PRICE REPORT



Region 1

Wholesale prices up a bit, the rest steady. Colony survival good through January. Packages and queens being brought in as shipping by the Post Office unlikely. Anti-dumping raising prices a bit.

Region 2

Prices steady, with only a few seeing increases due to antidumping. Good colony conditions in january give plans for fewer packages this year, but more queens.

Region 3

Prices steady across the board since last month with some increases due to antidumping creeping in. Good colony survival in January mean lots of splits, and queens.

Region 4

Bulk prices actually down a bit since last month, but the rest steady. *Varroa* in treatable numbers already showing in some places, and some colony losses showing up. Replacement packages and queens on order.

Region 5

Retail prices up a tad, the rest steady since last month, but prices inching up due to antidumping. Colony survival O.K., Small Hive Beetle causing some problems, and *Varroa* showing too.

Region 6

Retail a bit higher this month than last, the rest pretty steady. Excellent colony survival this year means fewer packages, but lots of queens to be ordered.

Region 7

Pails a bit higher this month, the rest steady, but bulk prices feeling the pinch from antidumping. Healthy colonyies so far, but packages and queens in demand.

Region 8

Pails down, retail up, the rest steady as far as prices go. Good colony conditions so far mean fewer packages but lots of queens on order this year.

Region 9

Good colony conditions so far for overwintering mean fewer packages, but lots of queens. Pails, bulk and retail prices down, while wholesale up.

Region 10

Bulk and retail prices down since last month. Pails steady and wholesale up. Overwintering about average in January, with 10-15% losses already. packages will be required.

Region 11

Prices steady across the board since last month. Wintering O.K. so far, with only 8-10% losses so far (in January). *Varroa* showing up already. Packages coming in, and lots of queens.

Region 12

Retail prices up a bit since last month, the rest steady, unaffected, apparently by antidumping. Colony losses in the 20-30% range for some, due in part to a tough season last year. Local suppliers will fill package and queen requirements.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
60# Light (retail)	75.00	75.26	74.00	73.00	75.00	72.50	64.53	60.50	80.18	62.00	81.17	65.00	60.50-81.17	71.51	71.90	69.54
60# Amber (retail)	75.00	68.85	68.00	71.85	65.00	66.00	68.64	58.50	70.00	62.00	76.17	65.00	58.50-76.17	67.92	67.77	65.94
55 gal. Light	0.72	0.75	0.62	0.60	0.63	0.76	0.73	0.72	0.62	0.72	0.75	0.35	0.50-0.76	0.73	0.69	0.61
55 gal. Amber	0.67	0.65	0.67	0.70	0.62	0.72	0.68	0.67	0.63	0.67	0.67	0.63	0.62-0.72	0.66	0.66	0.57
Wholesale - Case Lots																
1/2# 24's	34.56	27.59	28.83	32.85	28.83	27.43	27.41	28.83	28.83	28.83	25.00	29.90	25.00-34.56	29.07	28.52	29.46
1# 24's	49.20	41.68	48.00	44.86	43.40	53.00	40.47	43.92	40.80	38.40	52.00	49.80	38.40-53.00	45.46	45.13	43.73
2# 12's	41.52	37.55	46.80	42.85	40.43	40.00	36.54	45.00	37.75	31.80	50.00	40.33	31.80-50.00	40.88	40.44	40.77
12 oz. Plas. 24's	36.96	36.56	45.60	35.62	34.68	33.00	33.19	35.88	40.20	35.40	40.00	36.80	33.00-45.60	36.99	37.59	36.27
5# 6's	46.62	39.65	57.00	46.38	34.80	45.00	40.35	39.00	42.20	37.50	50.00	36.00	34.80-57.00	42.87	43.71	42.09
Retail Honey Prices																
1/2#	2.00	1.61	2.15	1.94	1.49	1.75	1.50	1.72	1.45	1.49	2.50	2.11	1.45-2.50	1.81	1.80	1.80
12 oz. Plastic	2.00	2.18	2.95	2.30	2.50	2.47	1.96	2.25	2.45	1.90	3.05	2.20	1.90-3.05	2.35	2.39	2.26
1 lb. Glass	2.75	2.46	3.00	2.98	2.40	2.68	2.28	2.80	3.63	2.52	4.70	2.97	2.28-4.70	2.93	2.90	2.81
2 lb. Glass	5.00	4.16	4.80	5.12	3.69	4.16	3.93	4.35	5.13	3.91	4.09	4.58	3.69-5.13	4.41	4.51	4.55
3 lb. Glass	6.11	6.98	6.80	7.17	6.11	6.50	5.24	6.46	7.00	5.19	6.99	5.46	5.19-7.17	6.33	6.34	6.48
4 lb. Glass	8.71	6.60	8.71	9.26	8.71	7.03	7.40	8.03	8.64	8.71	7.25	8.00	6.60-9.00	8.09	8.15	8.04
5 lb. Glass	10.75	8.74	11.00	11.07	9.00	10.00	8.76	11.14	8.98	8.98	11.45	9.20	8.74-11.45	9.92	9.64	9.67
1# Cream	4.15	3.21	4.15	3.59	4.15	3.93	3.79	2.83	4.15	3.04	4.33	3.42	2.83-4.33	3.73	3.68	3.11
1# Comb	4.00	3.80	3.60	4.55	5.26	4.17	4.30	4.05	5.26	5.26	4.75	4.00	3.60-5.26	4.42	4.52	4.35
Round Plastic	4.00	3.18	3.60	4.25	3.55	3.63	3.33	3.74	3.55	3.55	4.00	3.33	3.18-4.25	3.64	3.84	3.82
Wax (Light)	1.50	1.24	2.00	1.30	1.10	1.95	1.75	1.80	2.00	1.48	2.05	1.38	1.10-2.05	1.63	2.60	1.59
Wax (Dark)	1.50	1.61	1.75	1.28	1.00	1.75	1.62	1.00	1.00	1.22	1.50	1.25	1.00-1.75	1.37	2.28	1.24
Poll. Fee/Col.	45.00	37.80	40.00	35.33	25.00	42.00	38.50	40.00	28.00	39.43	45.00	46.33	25.00-46.33	38.53	38.47	38.01

New!

THE BEE GUARDIAN

Designed for beekeepers, by beekeepers, this cover is made to last years longer than any wooden cover would dream of! Tests during the Summer of 2001 show that it is durable beyond our greatest hopes. We froze the cover to 10 below zero and dropped it 20 feet to a concrete floor without a mark on the cover. It sat for weeks on hives during the Summer with temperatures in the 90s and 100s and no warping was detected. We ran over it with a truck and pounded it with a sledgehammer. It withstood everything we did to it (we didn't try to burn it). It can be nailed without splitting. It can be drilled and it holds screws securely but best of all it is 100% waterproof and has a patented "rainslope" which channels water off the corner and to one side of your beehive. Designed to be used on pallets of four hives, the high side of the cover is placed to the inside of the pallet thus channeling most of the water to the outside of your pallet and reducing significantly the moisture between the hives that causes wood rot. It is made of 100% recycled plastic.

For more information call 208.523.3692 or 800.515.7288 or FAX 208.529.3432; email bees@browningshoney.com

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This may be the best $20 I've ever spent on a beekeeping tool. The **Handle Bar** is a unique, new hive tool. It easily cracks open heavily propolized honey supers, and eases cleaning and moving frames by keeping your hands away from the cluster. It prevents breaking frames because you have more leverage when loosening the bottoms and separating the top bars. The patent pending design allows for easy prying and scraping and the bright orange grip helps prevent the loss of the tool. It is definitely more comfortable to work with than the original thin hive tools. It is an improvement that has been long overdue.

Available from The A.I. Root Company, 800.289.7668, Ext. 3255.

Beeaware.Info was founded by Kerry Bramble. Kerry is a migratory beekeeper located in Beemer, NE. After 25 years of traveling throughout the United States, Canada, and even a trip to South America, he decided to create a web site providing beekeepers with a fast and easy way to advertise their products and services. This web site was designed so anybody, at any time, could find anything, related to beekeeping all in one easy place (beeaware.info). It is also a great place for companies to advertise their products, services, and equipment, so they can be seen by the beekeepers who need and use them.

Visit **www.beeaware.info** or for additional information email customerservice@beeaware.info; kerry@beeaware info; orders@beeaware.info or fax 402.528.3894.

From The Honey Board A vibrant poster and informative guide developed by the National Honey Board highlight the many colors and flavors of honey.

The full-color poster and guide include photographs of 12 uniquely colored honeys along with illustrations of these honeys' floral sources. The materials also include descriptions of the 12 varieties of honey based on sensory testing done at rtech laboratories, St. Paul Minnesota.

Varietals featured on the poster and in the guide are alfalfa, avocado, basswood, blueberry, buckwheat, clover, eucalyptus, fireweed, orange blossom, sage, sourwood and tupelo. The poster and guide will be distributed to culinary schools, chefs and other food professionals.

These beautiful and informative materials are also available to the honey industry. The poster is available for $5; the guide is available for $1. To order, send your request with payment to the National Honey Board, 390 Lashley Street, Longmont, CO 80501 Call 800.553.7162 for special bulk pricing.

Queen Cage – Another Betterbee exclusive, this queen cage is plastic and has far better ventilation than the old wooden ones. There is a hook on top if you wish to suspend the cage from a nail between the frames. The little feet enable you to push the cage into the comb without leaving much of an imprint. The sliding top makes it easy to put the queen in the cage. The extra large opening on the sugar end of the cage is another feature that makes this cage easier to use. Use it over and over again – no screen. These cages easily snap together for multiple shipments.

The cost is 40¢ each (quantity pricing available). To order call Betterbee at 800.632.3379.

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

"Beekeepers now have scientific evidence that shows there may be a practical benefit for them to test hygienic and SMR queens in their apiary operations."

It is sometimes the case that reports detailing scientific progress appear to have little relevance to practical issues. Perhaps such was the case in 1632, when Galileo published telescopic evidence in support of the view that the Sun, rather than the Earth, was at the center of the Solar System. The issue may have seemed irrelevant at the time (except for those so invested in a contradictory view that they sent Galileo to the Inquisition). Yet 370 years later, using the physics developed by Galileo and others, humans have ventured into outer space and even developed global communication using artificial satellites. The perceived conflict between purely "*scientific*" and practical "*real world*" issues can be as true in apicultural science as in the space program. However, two recent publications on honey bees go a long way toward demonstrating the practical potential for earlier basic scientific findings.

In the first of these, Marla Spivak and Gary Reuter from the University of Minnesota, set up an experiment to determine whether hygienic behavior in honey bees had an effect on population levels of the parasitic mite, *Varroa destructor*. Hygienic behavior is a heritable trait of honey bees that Spivak and colleagues are interested in, partly due to its important role in resistance to diseases such as American foulbrood and chalkbrood. Honey bee stocks expressing a high level of this trait are better able to detect and remove diseased honey bee brood and brood infested with *Varroa* mites than are unselected stocks.

The authors set up a large scale experiment starting with 64 hygienic and 57 control colonies. The control colonies were headed by queens of the commercial strain "Starline" To compare the stocks under a realistic breeding scheme, hygienic and control queens were naturally mated to a common pool of unknown drones from the area surrounding an unselected apiary. This is perhaps a "worst case" scenario for how commercially available hygienic stocks might be produced. Since the use of unselected drones for mating would tend to dilute the hygienic trait in the daughter colonies, the experiment was biased toward reducing the likelihood of finding differences between the hygienic and control colonies. This conservative approach in experimental design is useful, in that it strengthens the confidence the researchers have in their results, if significant differences are found between the two groups.

Colonies were set up in February and managed in a commercial operation that migrated between Minnesota and Mississippi. Colonies received standard treatments, except there was no effort to control *Varroa*. Periodic measurements were taken to estimate the mite levels in the brood, mite levels on the adult bee population and the presence of brood disease. Honey production of the colonies was also measured. Hygienic behavior was compared between the two stocks using the "freeze-killed brood" assay. In this assay, the relative speed with which colonies remove freeze-killed brood from a test area on the comb is measured. Colonies that removed 100% of the dead brood within 48 hours were considered hygienic.

The authors found that the hygienic trait was significantly higher in the colonies headed by hygienic daughters naturally mated to unselected drones compared to the control colonies. In May, chalkbrood mummies were present in 63% of the control colonies vs. 30% of the hygienic colonies. At that time, both control and hygienic colonies had low levels of *Varroa* mite infestation (<1 mite/100bees). However, by September mite levels were significantly higher in control colonies than in the hygienic colonies. There was no significant difference in honey production between the two stocks (hygienic colonies averaged 113 pounds of honey, control colonies averaged 102 pounds).

The colonies were overwintered in Mississippi, and by the following spring, mite levels were high in the surviving colonies of both the control and hygienic groups. The authors suspected that the use of holding yards in the commercial operation (where colonies are temporarily moved to a single place) allowed drifting bees and robbing to more uniformly distribute the mite loads.

This research demonstrated that genetic differences between queens can have an effect on *Varroa* mite populations in a typical apiary situation. Measurements showed that brood area, adult bee population levels, and honey production was equal in the hygienic colonies compared to the controls. The authors caution that it is unreasonable to assume that bees bred for hygienic behavior will survive over the long term without some additional control effort by the beekeeper. However, they were encouraged that such bees may require less frequent miticidal treatments. Such a change could be an important part of a beekeeper's overall effort to reduce the risk of honey and hive product contamination and to lower operating expenses.

Another genetic trait of bees that appears to confer a measure of resistance to *Varroa* mites is SMR (suppression of mite reproduction). This trait causes foundress mites

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Mark Winston

Why So Many?

"Some very preliminary and so-far incomplete research suggests that the European/African species *Apis mellifera* is the most advanced of the honey bee species, and also may have the highest number of pheromone compounds."

Pick a number from one to 10. If you picked anything from one to nine, and probably if you picked 10, you would have picked the wrong number.

The question behind your choice of numbers was: How many individual compounds are found in honey bee queen pheromone? The answer used to be one, a compound referred to with the evocative name of queen substance that was only the second insect pheromone ever identified, back in 1960. The answer increased to two a number of years later, as a second, related compound was identified. My colleague Keith Slessor and our collaborating laboratories further jumped the right answer up to five in 1988, with the identification of two new compounds and clarification that the second-known compound has two chemical forms.

We thought that might be the end of it, but a recently graduated Ph.D. student of Slessor's, Chris Keeling, has now painstakingly and elegantly identified four additional compounds that attract workers to form a retinue around their queen. The original queen substance is produced in the queen's mandibular glands, as are the next four compounds identified, but the new fourplex comes from various locations in the queen's body.

But even that's not the end of it. Keeling also demonstrated that the now nine-component queen retinue pheromone still doesn't duplicate the full effect of the queen. There is at least one more unidentified compound, and possibly others, involved in attracting workers to their queen. That makes the honey bee queen retinue pheromone the most complex blend of chemicals produced by any insect, and begs the question of why so many.

Pheromones are communication chemicals produced by animals to send messages to other members of their same species, and are ubiquitous throughout the insect world. Female moths produce attractants to lure males in to mate, aphids secrete alarm odors that alert their fellow-aphids to the presence of a predator or parasite, and ants lay pheromone trails to guide nestmates to and from a newly discovered food source, such as your picnic chicken.

Honey bee workers and queens produce a diverse array of pheromones used for many purposes, and by now about 40 individual compounds have been identified. Prominent among these message-bearing odors is the worker alarm pheromone blend that is released when a bee stings, the nasanov blend that assists flying workers in orienting to their nest entrances or to swarm clusters, and a brood-produced blend that inhibits the development of adult worker ovaries and thus reinforces the reproductive dominance of the queen.

It is the honey bee queen pheromone, however, that has attained the highest level of complexity and function among all the insects. This 9-component and counting blend is distributed to the colony by the workers' retinue behavior, during which worker bees attend the queen, touch her with their antennae, legs, and tongues, pick up pheromone from her body, and then move through the nest distributing the queen's royal message to other bees.

Once distributed, its functions include inhibiting worker ovary development, suppressing the rearing of new queens, and overseeing the ages at which worker bees shift from nest duties to foraging. The queen's pheromone also carries the mystical "queenright" message, informing workers that the queen is present and all is well in her nest kingdom.

Queen pheromone is active outside the nest as well, and is attractive to worker bees seeking their queen when forming a swarm cluster or flying through the air to a new nest site. In addition, it attracts drone bees to virgin queens as they fly through congregation areas, and thus has the more prosaic, perfumy function of mating attractant.

While all of the nine or more compounds work together to attract workers to their queen, it is not clear which or how many of the individual components actually act directly on bees to stimulate or suppress behavior and physiological development. Only the original queen pheromone component, with the chemical nickname of 9ODA, has been definitively shown to affect worker bees physiologically. Thus

Continued on Next Page

"The compounds that attract drones to virgin queens for mating also have some specificity."

the other compounds are only known to function as attractants outside the hive or serve as a delivery device to move 9ODA around the nest. Those are unlikely to be their only functions inside colonies, but the precise role of each of the queen's substances remains undiscovered.

One likely reason for the multicomponent nature of honey bee queen pheromone is that various pheromone components may have different activities, with some blends being more important for some purposes than others. We do have some evidence that different compounds emphasize different functions for at least one adult worker behavior, the rearing of new queens.

If you recall your basic bee biology, colonies rear queens for three reasons: to swarm, to replace a failing queen (supersedure), or to quickly rear a new queen if the old queen is suddenly lost (emergency queen rearing). Both the adult queen and larval workers produce substances that suppress queen rearing by adult worker bees. A few years ago three researchers in my laboratory (Jeff Pettis, Heather Higo, and Tanya Pankiw) discovered that while both queen and larval pheromones are involved in all three reasons for queen rearing, the queen's pheromone is more prominent during emergency queen rearing situations while pheromones from young larvae may be more important in mediating supersedure.

The compounds that attract drones to virgin queens for mating also have some specificity. Drone bees fly back and forth in aerial regions called congregation areas, hoping to follow and mount a virgin queen as she flies through the cloud of waiting drones. Only some of the queen's chemicals are produced by virgin queens, while the full blend does not appear until after she has completed mating. Not surprisingly, drones are only attracted to the substances produced by virgin queens, so that the queen's mating attractant is a simpler blend than the more complex queen pheromone that affects worker bees.

There is an enormous amount of research work to be done to match each queen pheromone component to its function, but we also know almost nothing about how each compound acts to influence worker behaviors. The major exception is the role of 9ODA in mediating the ages at which worker bees begin foraging. Research from Germany as well as a collaborative project between the Winston-Slessor group and Gene Robinson's laboratory at the University of Illinois has demonstrated that 9ODA inhibits the secretion of juvenile hormone (JH) in worker bees.

A normal increase in JH levels from younger to older bees is partly responsible for the age-related shift from nest work to foraging. Thus, by acting on the JH system 9ODA may serve as a timekeeper, insuring that worker bees do not forage prematurely. Other compounds in the queen's blend may slow down or speed up hormone secretion or act on chemicals in the brains of worker bees that influence behavior, but so far we know little beyond the 9ODA-juvenile hormone interaction. Another queen compound (9HDA) has a specific role in swarm settling, and a third (MO) may be important in stimulating cell capping, but their modes of action are unknown.

The multicomponent mix also begs the broader and more philosophical question of why this complexity was scripted by evolution. Our North American honey bees were imported from Europe and Africa, but are only one of many honey bee species, the others which are found in Asia.

Some very preliminary and so-far incomplete research suggests that the European/African species Apis mellifera is the most advanced of these species, and also may have the highest number of pheromone compounds. The few studies that have been conducted indicate a gradual increase in complexity from few to many compounds as honey bees evolved from more primitive to more advanced forms.

This line of research may be useful to resolve the most fundamental question in social insect biology, which is why workers sacrifice their own reproduction for that of the queen. Biologists are divided into two camps, one believing that queens control worker reproduction and the other suggesting that workers cooperate with the queen to suppress their own egg-laying.

The queen control camp proposes that increasing pheromone complexity is the result of an arms race. This perspective suggests that worker bees slowly evolved ways to escape being influenced by a queen-produced pheromone, and as a result queens evolved additional compounds that better enslaved their workers. Alternatively, the cooperator camp suggests that it is in the workers interests to cooperate with the queen in pheromone transfer so that the needs of the colony are met. Thus, a more complex blend improves the workers' perception of the queen's pheromone and leads to its improved dissemination and effectiveness.

Whatever its origins, the functions and evolution of the queen's multicomponent pheromone blend provide endless opportunities for bright young students to explore this fascinating world of sociochemistry. These studies are not only of interest to basic science; agriculture and beekeeping also have benefited from this burgeoning field of chemical ecology. For example, the five-component honey bee queen pheromone is used as a pollination attractant on blooming crops, and can increase yield and income up to 30% when sprayed on pears, blueberries, kiwifruit, and some apple varieties. The same blend also can replace a queen temporarily when shipping bulk bees, and has potential to be developed as a tool to reduce swarming.

Whether out of basic interest or economics, honey bee pheromones remain one of the most challenging but fulfilling areas of bee research. Their calling card is intricacy, and beyond the research lies the underlying wonder that nature yields when complexity is subjected to rigorous study. BC

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that enter capped cells to be non-reproductive (see Research Reviewed Jan 2002). In another recent paper, John Harbo and Jeffrey Harris report results from a set of experiments they conducted to evaluate whether the SMR trait was effectively retained in colonies headed by daughter queens that were naturally mated to non-selected drones from commercial beekeeping locations. Over two years, the authors tested mite reproduction in honey bee colonies headed by queens representing various crosses between resistant and control stocks (R x C, R x R and C x C). The results showed that colonies headed by the free-mated R x C queens expressed a significantly higher level of resistance to *Varroa* mites (as measured by non-reproduction) compared to colonies headed by C x C queens. Colonies headed by instrumentally inseminated R x R queens had the lowest level of mite reproduction, but also had poorer performance in other areas (lowered brood levels and adult bee population) perhaps due to mating problems. The authors conclude that "commercially produced queens (mite-resistant queens that are allowed to mate freely) should provide beekeepers with some immediate relief from parasitic mites."

These two papers and the research therein address aspects of bee breeding with the obvious potential to speed development of sustainable *Varroa* management strategies in US apiaries. Yet, the present works were made possible only because previous research by these authors (and others) provided a level of understanding of the hygienic behavior and SMR traits adequate to move toward such implementation. In these publications, we have two good examples of research reports that should be useful to researchers, queen producers and beekeepers alike. Researchers will be encouraged to look at other genetically based traits as potential mechanisms for *Varroa* resistance. Queen producers may be interested to add assays for the presence of hygienic and SMR traits to their selection and breeding program. Finally (and to get back to the opening theme), while beekeeping may not be rocket science, beekeepers now have scientific evidence that shows there may be a practical benefit for them to test such queens in their apiary operations. BC

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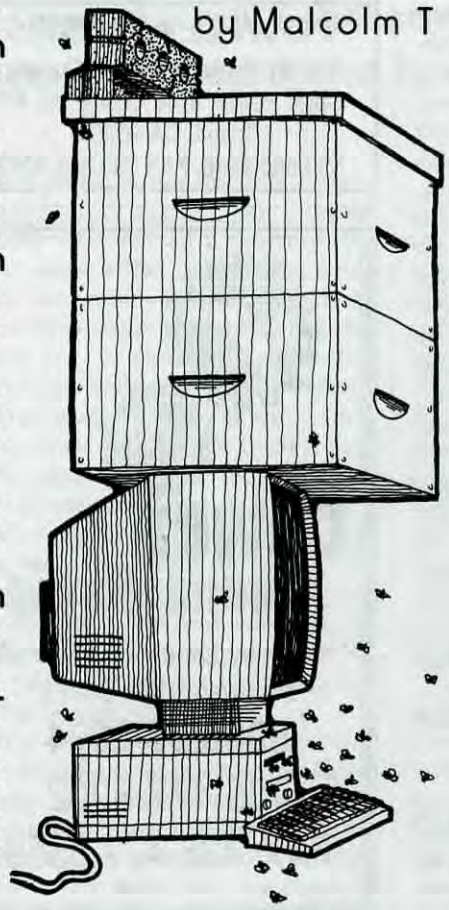
Beekeeping In The Digital Age

by Malcolm T Sanford



Selling Honey On The World Wide Web

By the time this column is published the National Honey Board referendum will be almost complete and the results will determine whether or not the Board will continue its present efforts to promote honey. Having worked with the Board on some projects and seen its professionalism while it goes about trying to promote one of nature's most complex gifts to humanity, I hope this entity will be retained by the industry. On the other hand it is difficult not to empathize with large-scale producers who believe they have footed the bill long enough for the entire industry. No matter how the vote goes, honey promoting and selling will continue and more and more of it will be done using the electronic technology of the digital age.

The National Honey Board in fact is one of the pioneers in this arena. I reviewed the significant efforts of the Board and its two Web sites in my column **June 1999**. Since then, much has been added, but most significantly is the honey locator with a new URL of **http://www.honeylocator.com**. According to the site, "The Honey Locator provides information about honey varieties —from alfalfa to wildflower!" The reason for a locator is because the color, flavor and aroma of honey differs dramatically depending on which blossoms the honey bees "buzzed." Since, there are more than 300 distinct types of honey, each originating from different floral sources across the U.S., it makes sense to provide a way to help those who might be interested find the many kinds that exist. There is no better way to do that it seems than a search engine provided by the National Honey Board. More than 8.5 million people visited the Board's two web sites last year (**http://www.nhb.org/**and **http://www.honey.com/**) and even more are expected to arrive in 2002. Most recently the Board has been publishing an electronic newsletter called Bee-Mail, which seeks to publish relevant marketing information about twice a month. **Back copies** are available. To get on the list, send e-mail to **honeybuzz@nhb.org** and enter the word "subscribe" in the subject field.

The **main or front page** of the locator enables one to search across states and honey types in an effort to find the proper match. A search for basswood, for example, across all states returned a listing of 41 companies. Selecting any of these results in a three-part listing, which includes all contact information, e-mail address, the products being sold, container sizes and markets usually catered to. Alternatively, there is an **advanced search** option. Thus, interested buyers can lookup individual company names by market segment, honey variety, partial zip codes, even telephone area codes. For example, searching for zip codes beginning with 32 revealed six companies, including one in my specific zip code 32609.

A press release dated December 19, 2001 congratulates Carl and Virginia Webb of Clarkesville, Georgia as grand prize winners in the National Honey Board's "*Show Me the Honey*," contest. According to Julia Pirnack, director of industry services, "Contributions like those from the Webbs have truly made the site not only informative but beautiful." For their entry, the Webbs will receive a prize worth over a $100, including a free annual listing on the honey locator. To list a company on the Honey Locator, call 888-421-2977 and press number 5 or visit **http://www.nhb.org/** for a Honey Locator Listing Request Form. If you paid at least $60 in assessments in 2000, you are eligible for a free listing. (If not, you must pay a combined assessment/fee of $60).

Many have become accustomed to free resources on the World Wide Web and unless already qualified, may balk at even the modest assessment fee described above. Other Web sites are there to accommodate those who want an alternative route to honey sales. At one time, several resources existed. Only one, however, continues to survive to this author's knowledge. This is a site is found at **http://www.localhoneyforsale.com/** According to the November, 2001 newsletter from Local Honey for Sale, published by Mr. Terence Golla, both **http://www.HoneyOnline.com** and **http:// www.HoneyCombers.com** are no longer available. This leaves Local Honey For Sale and the national Honey board as the only two sites providing services of this nature to beekeepers. According to Mr. Golla, his site is here to stay and he awaits your e-mails with anticipation at **newsletter@localhoneyforsale.com**.

Mr. Golla's **front or home** page states: "This is the place to locate local honey and other honey bee related products and services. This service is free to both the consumer and producer of honey bee related products and services. If you're looking for honey or any other honey bee related product or service click on Search in the menu above to check out our search page. If you produce honey or any other honey bee related products and/or services click on Members in the menu above to register for this free service." The registration page is not too formidable and certain sensitive data can be left off if desired. Each location is even mapped using an Internet program known as **mapquest**, and there is an option to look at a Web site, if one exists.

Another way to sell honey is to use digital advertising. Mr. Golla offers a number of alternatives, "We offer banner

advertising, advertising space in our monthly newsletter and opportunities to sponsor monthly contest such as Tell-A-Friend. In addition to your advertising, all sponsors are recognized on our sponsors page with a link and description of the services they provide."

There is a list of classified ads on the **apiservices** web site as well. I reviewed this mega site in **January 1999**. Selecting ads for just honey returned 79 possibilities. These revealed honey for sale from France, Romania, Indonesia, Brazil, and the Philippines. At this site you can register up to five key words. When ads are posted with these key words an e-mail is automatically sent to those who have registered with the site.

Other sites selling honey on the World Wide Web run the gamut of possibility. Most refreshing is locating many overseas sites selling honey that is not available in the United States. The sophistication of French honey marketing shows well in this arena. See for example a site selling, **lavender, rosemary and thyme** honey. African honey is available through **Baraka Agricultural College** in Kenya. According to this site, " The Beekeeping development Unit at Baraka assists farmers by helping them to market their honey through the college. Our aim is that groups of farmers themselves take over markets we develop on their behalf. We provide technical training to farmers on proper harvesting and handling of honey and also provide them with clean air-tight buckets in which they store honey after harvest. We do this to ensure that consumers receive honey of the highest quality." Large-scale producers also are represented. Consider **Rainforest Honey** from Australia. "From humble beginnings, selling door to door and at the Sydney markets, the company has grown to a very successful level. The owners now own 2,500 hives and have exported over 204,000 kilos of bulk honey to Europe and Asia over the last 18 months (Sept 2000). As they have turned their attention to the stringent requirements of the bulk honey world market, this honey is not available in Australia!" It may seem bizarre that produce of one nation is not available domestically, but this occurs all over the world. Midwestern super markets, for example, carry much better quality Florida citrus than do most of those in the Sunshine state.

One can also find advice about selling honey on the World Wide Web. A recent query about how to sell one's honey to the **Garden Web** provoked numerous replies that were well received by relatively small-scale producers. Thus, one person said, "I have sold almost all my honey from last year. About 10 gallons from 100 left. I sell a decorated 1/2 pt. for 3$. My pt. sells for 4$. And my qt. sells for 8$ I have had a few people tell me I am over priced. But people I sell to double there price and they keep coming back for more. People like raw honey and it sells. This years crop was very poor. My prices stay the same, I will just run out earlier." A reply issued stated, "you probably are overpriced, as the wholesale price of bulk honey is under $1 a pound. You are probably overpriced when people can go to Sam's Club and Costco and pay just over $1 a pound for fine adulterated Argentina or Chinese honey. I actually saw "Chinese honey" in a Chinese grocery store that said it contained honey, sugar syrup. You are probably overpriced compared to the over processed, over heated, flavorless honey that sells in our grocery stores. But the key is this... your honey is hand harvest, hand packed and TASTES BETTER. And without all the problems of mass production, is probably healthier too. The key is in the product. Some cars cost a lot. Compared to a Yugo, a Cadillac is over priced. Your response to those people who say your product is over priced should be: 'This is a premium honey. It's not the same as the cheap stuff in the store. Taste it and see. Here... here's a sample. ... Now, isn't that the best tasting honey you've ever had?'"

Cooperatives selling honey are found on the Web. This form of enterprise has many things going for it, especially buying and selling using economy of scale. One of the most successful is found in Canada. A history of **BeeMaid Honey, Ltd** reveals that it has been around a long time: "BeeMaid Honey finally commenced operation in 1959 when the Manitoba and Saskatchewan Co-Operatives agreed to market all their honey jointly. In 1961, the Alberta Honey Co-op participated with the Manitoba and Saskatchewan Co-Ops through BeeMaid Honey in developing the export market, and in 1962 began full participation in both the domestic and export markets." The range of products serves both **retail** outlets in both the United States and Canada and **food service** markets in Canada (the Beekist line).

Cooperatives in the United States have had a checkered history. One, however, has been a huge success story. This is the former Sioux Bee, now known as **Sue Bee** or just "Sue." Sue's Web site is comprehensive and contains a history of its founding: "With $200 and 3000 pounds of honey, five beekeepers located near Sioux City, Iowa, formed a cooperative marketing organization in 1921. It was named Sioux Honey Association after the city of its founding. Since then the cooperative has become a world-wide marketing organization. Its global presence extends to the Middle East, Far East, Europe, South and Central America, and it continues to be a leader in the honey industry with state-of-the-art facilities and labor and developmental research. Sioux Honey Association is also a green company, which means our products and containers are safe for the environment and that we continually do things to help the environment. We value our customers through recycling, innovative engineering, and cutting back on over-packaging."

The cooperative model has been proposed as appropriate for selling honey from **Belize** to **Bulgaria**. As described at the University of Wisconsin Center for Cooperatives: "Sons of a medieval Bulgarian king debated who would rule after their father's death. The king requested that a quiver of arrows be brought to him. He removed a single arrow and causally snapped it in half. Then he removed the remaining arrows from the quiver, held them out to his sons, and requested they break them. The sons tried to break the bundle of arrows without success. The king then told his sons that, individually, people, like the arrows, are easily broken, but there is strength through unity. Today, that lesson 'Strength Through Unity' is engraved in the Cyrillic alphabet above the entrance to the Bulgarian National Assembly in Sofia. It's become a time-tested phrase from Bulgarian history and one that's applicable across the cooperative world. Bulgarian beekeepers, following this example, formed cooperatives to purchase supplies and to market their honey production. In a country still undergoing its transition to a market-driven economy, individual producers work together to coordinate their efforts to create a better situation for all the beekeeper-members. They're learning the age-old lesson of strength through unity." This continues to be appropriate even using digital age technology. BC

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The Future Of American Beekeeping – Protectionism or Productivity?

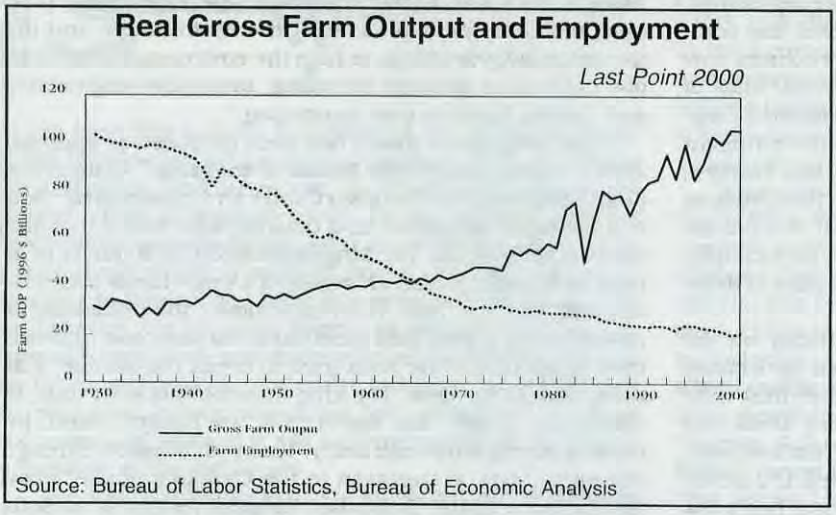
A. Gary Shilling

to the 2002 Convention
American Beekeeping Federation
Savannah, GA, January 18, 2002

In 1900, 40% of employed Americans worked in agriculture. By 1930, their number had dropped to 23%, or 10.2 million. In 2000, the nation had a mere 2.1 million farmers, or 1.5% of the workforce. Yet, since 1930, physical agricultural output has grown 250% (*Chart 1*). So each farmer is producing 17 times what his counterparts did in the 1930s.

Farming is supposed to be the domain of less-developed countries with their hordes of cheap labor while developed lands tend to be more effective and competitive in the higher tech end of the spectrum. Yet American agriculture is so efficient that exports, which now account for about 5% of total U.S. exports, continue to exceed agricultural imports.

CHART 1



Source: Bureau of Labor Statistics, Bureau of Economic Analysis

Productivity In Agriculture

What has accounted for this spectacular performance of American agriculture? To be sure, the U.S. has abundant land that is well-suited for growing grains and other crops. But the same can be said of vast areas of South America, Africa and even Europe in countries like France and Ukraine. It's also true that agricultural subsidies have been substantial in the postwar era, but that's equally true of most of our competitors in global markets. European farmers, for example, receive much more government help.

Our analysis indicates that rapid productivity growth has been the key to the success of American farming. It's come in part in advances in equipment. Many decades ago, tractors replaced horses. The reaper replaced men with scythes, and the combine combined the functions of the reaper and the thresher. The cotton gin replaced human fingers in picking out cotton seeds, slashing costs even though those fingers belonged to low-cost slaves. Continually-improving hybrid seeds have been another big productivity booster. More recently, genetically-altered seeds combat scourges ranging from the corn borer to the bollworm, while others make soybeans resistant to herbicides.

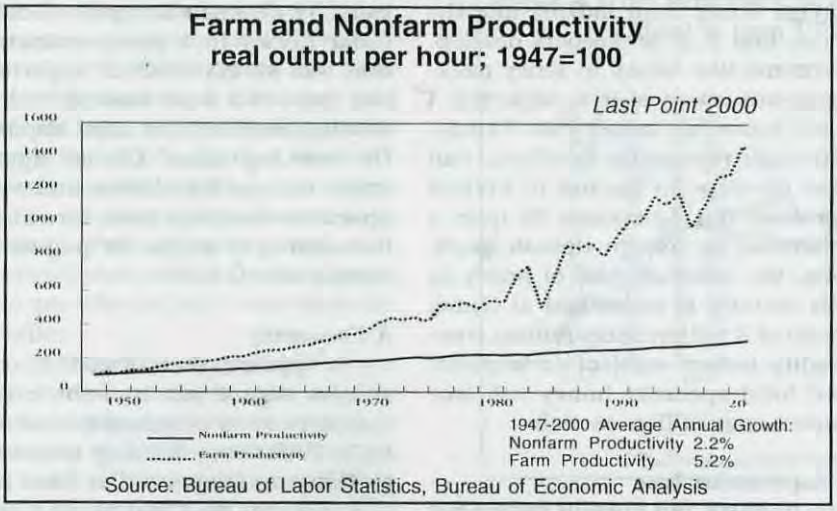
Satellites and other new tech helps push down costs by determining the precise amounts of fertilizer, pesticides and water for specific fields or even areas within large fields. Ongoing consolidation of farms, increasingly run by well-trained and educated farmers, spurs economies of scale and the utilization of new technology.

Because of all these factors, productivity in agriculture, as measured by physical output per hour worked, has risen 5.2% annually on average in the postwar era, more than twice the 2.2% rise in the nonfarm private economy (*Chart 2*). This is an amazing accomplishment for an industry that is far from new and, indeed, dates from the beginning of civilization.

Beekeeping Lags

The same, however, can not be said of beekeeping. The late Prof. Roger A. Morse, in the Spring 1999 edition of *American Heritage of Invention & Technology*, pointed out that today's beekeeping resulted from four important inventions. First and foremost, in 1851, the Rev. Lorenzo L. Langstroth of Philadelphia discovered the bee space and went on to invent movable frames for hives. Then in 1865, Major Francesco Hruschka of the Italian Army invented a centrifuge to extract uncapped honey from those movable frames. Next came the foundation machine, pioneered by A.I. Root of Medina, Ohio in the 1870s, which imprinted the hex cell designs on bees wax sheets, thereby encouraging the bees to draw straight and parallel combs. Finally, Morse lists the smoker, invented by Moses Quinby of St. Johnsville, N.Y in 1875, which makes it easier for beekeepers to get to those frames.

CHART 2



I'm fascinated that even though beekeeping is at least as old as recorded history, even though honey was a very important source of sweetening until cane sugar was developed in the 18th century, and even though honey bees are all from the Old World, three of those four crucial inventions were the work of Americans in the latter half of the 19th century. Americans have always been great at practical technology, and this was American ingenuity at its best.

It's also true, however, that the youngest of these inventions is 127 years old. After that 24-year burst of new tech in beekeeping from 1851 to 1875, the industry became decidedly low tech, with only minor improvements. Ironically, even though beekeeping is obviously part of agriculture, the orientation toward new technology and productivity improvement seen elsewhere in that sector has not spilled over.

To be sure, researchers and queen breeders are working on bees that will be resistant to mites and diseases, but without noted success so far. In fact, beekeepers aren't even keeping up with the pests, as witnessed by the vast number of hobbyists, sideliners and commercial beekeepers who have hung up their veils in recent years.

Globalization

Yet, substantial efficiency is needed in an era of leaping globalization. And if you don't believe we're in that sort of world, just look at stock markets, in many ways the final bottom line for business and finance. As a portfolio manager with decades of hard experience, I can tell you that markets can remain irrational a lot longer than I can remain solvent. Still, when the dot com bubble broke, it didn't matter whether you were in U.S., Japanese or European markets. You got killed (*Chart 3*).

In the honey bee world, globalization occurred almost 400 years ago when the first European settlers brought bees to the New World. More recently, *Varroa* and tracheal mites as well as the small hive beetle and African bees came here from the Old World. To these threats to American beekeepers have been added imported honey, especially commodity imports from cheaper labor countries like China and Argentina.

Alternatives

To be sure, there are somewhat safe havens from this onslaught. One is pollination. No one is likely to figure out an economic way to dig up the almond trees in California, take them to China for pollination and then bring them back and replant them each year. Indeed, the fact that about half, or 1 million, of American bee colonies are used in pollination suggests that renting bees to farmers is more profitable than straight honey production.

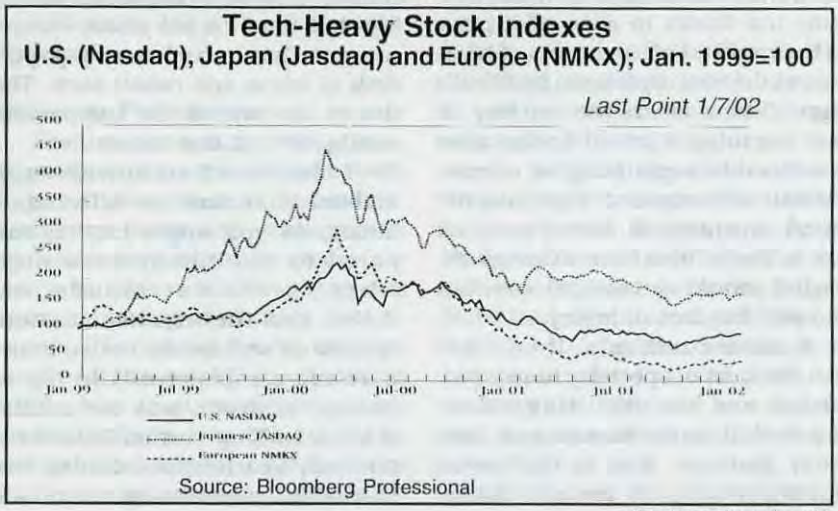
Still, most migratory beekeepers also need to produce and sell honey to remain financially viable. Also, don't bet that the pollination business is indefinitely free from foreign competition. Almonds are natives of Asia and northern Africa, and countries in those areas have potentially a lot lower costs than California. Furthermore, self-pollinating almonds and other crops may be developed.

Specialty honey sold in attractive environments is another niche that's relatively safe from cheap imports. Dr. Medhat Nasr, now at Rutgers University in New Jersey, told me of the tremendous success of some Canadian beekeepers in promoting their wares to tourists and school groups. One developed a mini-theme park based on bees that offers tours of a bee yard and honey house, and invariably end up in the gift shop. Opportunities to sell local honey in farmers markets and to offer specialty honey in attractive packages in food boutiques and even supermarkets are far from exploited.

Sizzle and Steak

No question, there is sizzle as well as steak in honey, and the enjoyment can leap if the producer is

CHART 3



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viewed in a favorable light. I give away to clients and friends each year all the honey my bees produce, some 2300 pounds this past Christmas. Year after year, many say, in oral comments and thank you notes, that mine is the best honey they ever tasted. Well, I hope so, but in northern New Jersey where my bees are located, the nectar comes largely from black locust, basswood and tulip trees, and the mix of nectars, and therefore the taste of the honey, clearly varies from year to year. What are my friends tasting – the steak of the honey or the sizzle of a gift from their friendly economist and portfolio manager who also happens to love beekeeping? I also wonder if many of them buy honey when our annual gift runs out.

In any event, I question whether specialty honey, even if fully exploited, can save American beekeeping. Americans simply don't have strong traditional and cultural zeal for honey, nothing like that in the Middle East – and I'm not referring to Osama bin Laden's use of honey shops and shipments of honey to move money, drugs and even weapons. The scheme works well since dogs can't smell drugs or an AK-47 in a 55-gallon drum of honey, and customs agents don't want to get their hands sticky.

Saudi Arabia produces little honey, but households there consume about 2 lbs. per *month* on average compared to 4 lbs. per *year* in the U.S. My wife and I recently visited Turkey, and the Turks' zest for honey was clear when we arrived at our hotel in Istanbul. In the breakfast buffet was a comb of honey, inviting the diners to slice off a piece for their toast. I also saw lots of hives around the countryside. In Istanbul's Grand Bazaar where you can buy almost anything, I priced honey, after considerable negotiating of course, at about $3 per pound. That may not sound expensive to Americans, but it is to Turks who have incomes averaging about one-tenth of ours, but who still buy lots of honey.

It seems unlikely, then, that even the best of specialty honey promotion and the resulting value-added will turn Americans into honey gluttons. And to the extent that Americans do become honey fanciers, there is nothing to prevent foreign honey from moving into the niche that U.S. beekeepers develop. Germans like honey in fancy packages, but much of it is imported. I don't know that honey from Yemen, although reportedly excellent, can ever develop the cachet of French perfume, but Americans do have a weakness for foreign upscale products. So, although half of honey in this country is consumed at home, much of it will probably remain commodity honey, subject to imports, and local specialty honey will face import competition as well.

A Supermarket Tour

To check out current demand, I took a recent stroll through two supermarkets in my area in suburban New Jersey. Shelf space is always limited, so grocers carry what consumers are indeed buying. One supermarket, a middle-level store, had 14 offerings that ranged from 12 oz. bears to 3 lb. jars, and included Dutch Gold, SueBee, Winnie the Pooh and Golden Blossom as well as house labels. I was struck by two things. First, 6 of the 14 were house brands, and for every national brand size and shape, there was a house brand equivalent that averaged $1.97 per pound, or 61% of the average national brand price of $3.21. Second, of the national brand labels, 5 read "Product of USA," and one said "USA and Canada." Two of them, however, read "Product of USA, Canada and Argentina," as did all of the house brand labels.

What the labels didn't tell me was the percentages of honey from each country. Was it one-third, one-third, one-third, or 1% U.S., 4% Canadian and 95% Argentine honey? My dad used to tell about the restaurant that served a very popular dish of horse and rabbit stew. Then diners discovered the composition: one horse and one rabbit.

I also visited an upscale supermarket that had 18 offerings of honey. As you might expect, compared to the middle-brow store, fewer were house brands, only three, and the identical national brands as well as the house brands were more expensive. The big difference, however, was the addition of imports. They carried Golden Nectar Real Leatherwood honey from Tasmania, Australia in an unusual bottle and labeled "Product of Australia." I also saw Langnese Golden Clear honey in a fancy container that was simply labeled "imported." But imported from where? France, as the French on the label implied? Or from Argentina? China? Apparently, the packer thinks that even upscale consumers don't care about the country of origin, as long as it's outside the U.S.

A Commodity

It appears, then, that U.S. consumers regard much of the honey they buy as a commodity and see little difference among domestic products and imports. The other half of honey that goes into baked goods, breakfast cereals and beverages is definitely a commodity. *With any commodity, all that matters to the buyer is cost for the standard product.* So, if you're not the low-cost producer, you're not going to survive for long.

The pressure on costs will only intensify in the worldwide deflation I foresee for many years to come. Deflation will result from global surpluses of almost everything, and will generate excruciating competition and intense foreign zeal to export to the world's biggest buyer, the U.S. Since beekeeping has not enjoyed any major productivity enhancement in 127 years, it remains very labor intensive. So, as we all know, countries like Argentina and China, with much lower labor costs than in the U.S. and tremendous zeal to export, are serious threats. Wages in China are about 3% of American pay, and they were 27% in Argentina but now are 13% after the recent currency devaluation.

Imports Surge

The results aren't surprising. From 1998 to 2000, imports from Argentina and China rose from 105 million pounds to 152 million as their prices fell 25%, while U.S. production and carryover were static at a little over 300 million pounds. All of the growth in U.S. consumption went to imports.

The American beekeeping reaction to low prices and surging imports, of course, has concentrated on federal government subsidies and anti-dumping rulings. Now, I understand the difference between free trade and fair trade, and I'm not debating the merits of restrictions

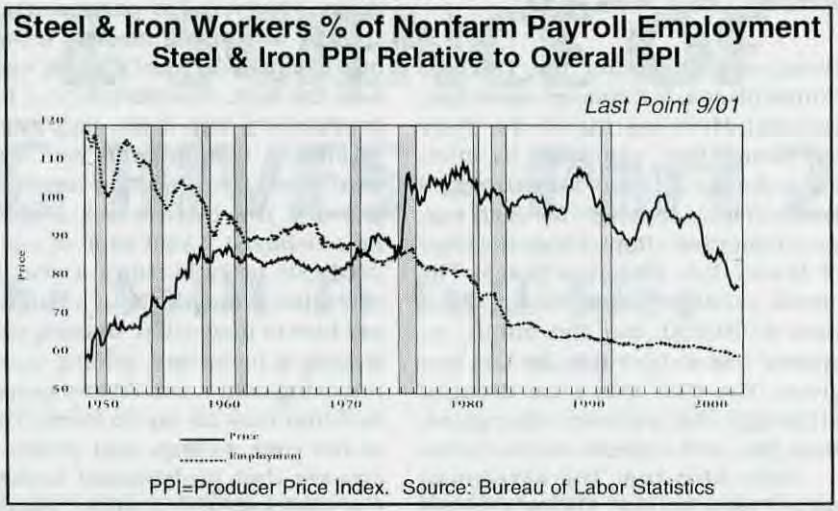
on dumping, i.e., selling products here for less than in their home markets or below the cost of production. But, the line between fair trade and protectionism is a fine one, and protectionism is perennially popular among domestic makers of any product who can always blame their woes on the usual suspects, foreign competitors. Politicians also cotton to protectionism since the foreigners who are affected can't vote them out of office.

Protectionist measures are usually viewed as short-term expedients. Just give us time to regroup, and then we'll take on those foreigners head to head, is the usual plea. Some beekeepers share this view today, but history says these short-term expedients are addictive as an uninterrupted string of short runs becomes the long run. Grain farmers here and abroad are hooked on subsidies and import quotas, as are U.S. sugar producers. Most important, protectionism simply doesn't work even in the domestic economy. High fructose corn syrup has replaced sugar in virtually all soft drinks and many other processed foods. Protectionism is an even bigger loser in the international arena because of today's increasingly global and largely open economies. The U.S. steel industry offers a frightening example.

Steel Clout

Steel was new tech in the late 1800s and early 1900s. Andrew Carnegie used the then-new Bessemer process to make railroad rails from steel, which wore much better than iron. The open-hearth technique for making steel was another huge advancement, as were the electric furnace and continuous casting. But innovation largely stopped in recent decades except for mini mills that make steel from scrap. Predictably, American producers have not been able to compete in the global arena. They face worldwide excess supply and foreign producers that are equipped with newer, more efficient equipment and sponsored by developing as well as developed country governments that love to export steel to the U.S. And predictably, the U.S. steel industry has concentrated on protectionism, not productivity improvement. Productivity growth in iron and steel since 1947 is only one-third that in agriculture.

CHART 4



PPI=Producer Price Index. Source: Bureau of Labor Statistics

American steel employs a bevy of lawyers and lobbyists who continually file anti-dumping charges and other actions to deter imports and to keep importers off balance. This industry has traditionally had lots of political clout and still does. Note that the Bush administration, concerned about political support in steel-heavy West Virginia, Pennsylvania and Ohio, recently called for a global steel cartel to slash excess capacity. Foreign governments and producers were essentially told that if they didn't cooperate, U.S. imports would be cut further.

The steel industry has consistently argued in each round of protectionism that if imports are limited just one more time, it will cut costs, modernize and become competitive. After a recent industry-favorable International Trade Commission ruling, Thomas J. Usher, CEO of USX-U.S. Steel Group, said, "The object of this remedy is to give the industry breathing time" to return to profitability. But this has never happened.

Self-Feeding Protectionism

Besides detracting from pursuing productivity, protectionism feeds on itself. Government subsidies, emergency loans and protectionist regulation keep obsolete excess capacity in place, which depresses prices, requiring even more protectionism. The steel industry employs one-third the workforce it did in 1968 when it started pressuring President Nixon to protect it "temporarily" from imports. Maybe what steel management and labor leaders are really saying is, after me, the deluge – we know the industry is going down the tubes, but please force taxpayers and steel buyers to keep it alive until we retire.

Steel employment has dropped from 0.6% of total nonfarm payrolls in 1948 to 0.1% as imports have still engulfed the industry despite stringent measures to keep them out. When raw steel imports are proscribed, foreigners simply shift to making and sending steel products to America, further reducing U.S. employment. Furthermore, steel prices have fallen 30% in relation to overall producer prices since their 1979 peak (*Chart 4*), and are now at a 20-year low. Since 1997, 28 steel companies, a quarter of the total, have filed for Chapter 11 bankruptcy, including the third and fourth biggest, Bethlehem and LTV Corp. One of the few viable firms is the second largest, low-cost and nonunion Nucor Corp., which pioneered the mini mill concept and has concentrated on productivity and cost reduction, not protectionism.

Is Beekeeping Any Better Than Steel?

If big steel has failed miserably at protectionism, can beekeeping succeed? It certainly doesn't have steel's political muscle – although Senate Majority Leader Tom Daschle is from South Dakota and Senate Budget Committee Chairman Kent Conrad represents North Dakota. Note that despite considerable attempts by Congress to eliminate agricultural subsidies and price supports in the 1986 tax act, the only one that was axed was the honey subsidy.

The honey bee did attract na-

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tional attention after the 1995-96 *Varroa* plague, but concern soon died. General Mills instituted its "Save the Honey Bee" campaign by offering to donate 25 cents for *Varroa* and tracheal mite research for each cartoon honey bee clipped from the front of Honey Nut Cheerios boxes. The cereal producer was willing to donate $100,000, but the public response was so poor that far less was given. The offer was soon dropped although the cartoon character, Buzz Bee, still appears on the boxes.

Note also that the agreement with China in the 1990s to limit honey imports simply rerouted a lot of it through Canada. I hope you're also aware that the new 33% to 61% anti-dumping duties on Argentine honey have already been more than offset because Argentina recently decoupled her peso from the dollar and it's dropped 54% so far. China is very upset with the recent collapse in the Japanese yen and other Asian currencies because it makes her less competitive in export markets. I fully expect China to devalue, and that could offset much or all of the anti-dumping duties on Chinese honey.

Productivity Enhancement

If protectionism is highly unlikely to save American beekeeping, what will? In my view, productivity enhancement. Wheat, corn, soybeans and other grains are internationally-traded commodities, but American farmers are low-cost producers because of technology and modern management. Why can't American beekeepers do the same, in some cases using similar technology?

Plastic frames mass-produced in factories may prove to be more cost-effective than assembling them by hand, even in slack winter months. Plastic insulated boxes that keep bees cooler in Summer and warmer in Winter may also be effective. If researchers and breeders succeed in producing pest- and disease-resistant queens, at least some of the new problems of recent decades will be eliminated.

What's Inside?

Much, much more needs to be done, however. I'm particularly intrigued with using modern technology to find out what's going on inside the hive. Wouldn't it be a huge productivity leap if you only needed to open a hive or even visit a bee yard when the computer in your office told you there was a problem? As a hobbyist, I visit each of my bee yards six or eight times a year and each visit averages about a half-hour per hive in inspection, making splits, feeding if necessary, adding supers, removing honey, etc. I'd love to spend half that time on my 65 hives. Think of the time savings and profits increases that professional beekeepers and sideliners might enjoy if they cut their labor per hive in half.

John R. Miller of Miller Honey Farms once told me about a dairy farmer who put electronic sensor-laden collars on his cows. Every day, he could download information on how much food the cow consumed and how much milk she produced. The farmer could even judge a cow's health by examining data on how many steps she took. Healthy cows move around more than sick ones.

Maybe today's proven technology could be similarly be applied to the beehive in cost-effective ways. Prof. Jerry J. Bromenshenk of the University of Montana has developed tiny transmitters that can be attached to queens' backs. By detecting motion, you'd know that a queen is alive. The temperature inside the hive is higher and stable if the queen is laying, so temperatures probes could save all that time spent opening the hive and looking for the queen and eggs. Transmitters attached to worker bees could determine the intensity and range of their foraging. Acoustical sensors might be useful in detecting pests and diseases in the hive, and pallet-sized electronic scales would tell the beekeeper if syrup, on the one hand, or supers, on the other, were needed. Measuring rainfall in a bee yard and its environs would yield valuable information on prospective honey flows.

All this information could be recorded by a CPU outside the hive and then read by a hand-held device. Or the data could be transmitted to your office by radio, cell phone or satellite. This data would not only alert the beekeeper to current conditions and problems, but could identify patterns that would help him manage his colonies for optimal profits.

The Bottom Line

Bear in mind that I'm not talking here about reinventing the wheel. No, I'm talking about applying today's technology to an industry that has not taken advantage of it – beekeeping. By using *known* technology, it's likely, but not guaranteed, to be cost-effective. In essence, I'm talking about leaps in productivity, achieved by slashing the time needed to produce a pound of honey.

Automating and getting labor out of their products is the key to most American industries that successfully compete in global markets. And not all of them are high tech by nature. Textiles and apparel are among the first industries that developing countries develop, and much of what we all wear is made in China, the Caribbean and in other cheap labor countries. Yet 90% of our socks are produced in this country. Socks, you wonder? Well, that industry has automated to the point that only 20% of the costs are labor, and many of those people are skilled "fixers" who keep the sock machines functioning smoothly. Developing countries can't duplicate this process since in those lands, hand knitters are cheap, but machine fixers are not. Furthermore, American sock producers' physical proximity to their customers reduces inventories and helps them respond quickly to customer quantity and quality needs. Is it reasonable to suggest that American beekeepers emulate American sock producers?

Productivity growth has always been the surest and most consistent route to prosperity for any country, industry, company or individual. Protectionism seldom works, and never for long. It appears that big efficiency gains are possible in beekeeping, but will they prove cost-effective? No one knows now, but I urge the industry to find out. Otherwise, American beekeeping will probably become increasingly marginal and unprofitable. BC

A. Gary Shilling is an economic consultant, investment advisor and Forbes *columnist. He is also a sideline beekeeper.*

THE ART & SCIENCE OF SPLITTING HIVES - Part 2

Growing The Split To Full Size

James E. Tew

Some extraneous comments before writing about splits

This is a strange way to start a bee article, but bear with me for I do have a purpose. I'm an unaccomplished handyman. With no experience, I took on the project of installing a "floating" hardwood floor in one of my bedrooms. Naturally, the retailer had very little information other than what came with the flooring, but there was a web address for other questions that could be sent directly to the manufacturer.

In my do-it-yourselfer way, I wrote out my situation in some detail including an explanation that my sub-floor floor had some annoying squeaks that I had already addressed with screws. Then I was at the point to pose my question, "Should I glue the floor to the subfloor as instructed or should I attach it with staples?" Within a day, I had a 10-word answer to my 1200 word question and that answer was, "If the sub-floor squeaks, then the installed floor will squeak." That's it? After paying more than $1000 for flooring, the supportive response I get is a brain-dead answer that didn't address my question? At that moment, I realized I was on my own with this project. I decided to go with the glue. So what does this have with beekeeping?

As I sat before my computer, offended and feeling child-like, I reread my response from the company, and thought, "How many times have I done this to beekeepers who were quizzing me on various bee subjects? Did they feel the way I feel right now?" The obvious advantage to email is that you and I can (in theory) communicate rapidly but sometimes the responses can come back terse and unfeeling enough to be outright offensive. How many times have I driven home in the afternoon thinking that I had efficiently answered 38 email messages without realizing I had annoyed some of the recipients? A sincere global apology to those to whom I have done this and a resolution for my new year – I will make a greater effort to compose thoughtful and timely answers in all formats.

So where to from here with my splits?

With that off my chest, I would like to make some additional comments about hive splitting that I began last month. For those who didn't get a chance to peruse that piece, I attempted to put the chaos of hive splitting in a logical order. I stopped at the point where the divide was made and the caged queen was in place. Onward from that point.

When to release the queen?

In general, anytime a queen is released, the same precautions should be followed. My undocumented rule-of-thumb is that the bees will react to the queen in the same way they are reacting to the cage. If the bees hold on to the cage tenaciously and seem to be attacking the cage, they logically will react to the new queen in the same way. If the bees show interest in the cage but are gentle and can be brushed away (even if they scurry back to the cage), it's probably safe to release her directly.

For the sake of discussion, let's say that it's early spring and four days ago, you made a 3-frame split – one frame of mostly capped brood and two frames of honey and pollen. You transferred about two pounds of bees and positioned a queen cage beside the brood frame with the candy plug exposed. What should your queen program be at this point? Following the general pointers above, release the queen if all seems well. As a pointer, if all does not seem well, have a quick

A 5-frame split with a feeder jar in place.

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SPLITTING ... Cont. From Pg. 25

look at the brood frames for eggs. If you see them, you accidentally moved the queen from the parent colony and you now have a new set of problems that we will not go into at this time. Even if you don't see eggs, take a quick look for the queen on the brood comb. Rarely, but occasionally the old queen is there. In that case, releasing the new queen is out of the question and again, you have a new set of problems. Generally, four days or so is enough for the bees to accept the new queen, but stranger things have happened and it may take a day or so longer.

When you release the queen, be gentle in your movements, open the cage a bit and allow the queen to exit onto the comb. Another doomsday pointer – occasionally, the queen will not readily leave the cage (Strange isn't it?) and needs prodding. Upon prodding, the queen will sometimes explode from the cage and fly away. After you quickly finish gasping and using those special-occasion words, move away from the split, leaving it open for thirty to forty minutes. Sometimes (I don't know – maybe half of the time), the lost queen will buzz about and will return to the opened split box and you luck-out. You can only tell if this happened by returning to the split 3-4 days later to look for either her or her eggs. If she is not there and queen cells have been started, simply return the split to the hive from whence it came – using copious smoke – and write it off to experience.

If however, all goes well with the queen being released, and she strolls onto the comb, close the split and leave things alone for about three days. On the third or fourth day, you can quietly open the split and see how she is fairing. If she and her eggs are present, you are home free. If she is not there or there are other problems, I would recommend cutting your losses and returning the split to the parent colony. Just more experience. However, most of the time, your new queen will be fine and happy in her new hive.

When to move to larger accommodations?

In our hypothetical split, it is now springtime, flowers are blooming, birds are singing and your split is growing. Commonly, it will grow remarkably fast. If you used a 3-frame split in a three-frame nucleus hive, it will need upgrading to a single deep immediately. If you used three frames in a five or six-frame nucleus you have a week or so before you need to provide more space. As discussed in last month's article, if you partitioned your three frames within a deep hive body, remove the partition (The partition is called a follower board.) and give the bees free run of the deep.

So you want to build the split up as fast as possible

The split described above can only prosper so much as allowed by weather and natural floral sources. Obviously, you can supplement that by providing protein and sugar feed.

"If you want a full size, fully productive colony *THIS* year from a split you'll need to take good care of it and push hard."

Feeding sugar

It's a bit labor-intensive, but when feeding a few splits, I favor cutting a hole in a flat board cover and placing a feeder jar right on top of the cluster. To cut such a hole perfectly round and safely, set a winged circle cutter to 2 3/8″ chuck it in your drill press and drill a hole in the center of a plywood board that is just a bit larger than the outer perimeter of a hive body. No drill press? You can unsafely chuck the hole cutter in your electric hand drill and attempt to drill the hole. Alternatively, you can buy a dedicated hole saw, having a diameter of 2 3/8″ that is safer to use in a hand drill or you could splurge and buy a large, expensive, toothed Forstner bit. Your final option is to cut the hole by hand with a saber saw or with a keyhole saw, but your frustration level will be higher. If you don't favor this hole-cutting procedure, use the feeder of your choice, but it is important to feed the growing split with some kind of feeder and feed thick sugar syrup or high fructose corn syrup – not thin watery syrup. You can also add additional frames of honey, from what you've saved or from stronger colonies, to feed the split.

Feeding Protein

The ideal protein to feed bees is disease-free pollen that you collected the previous year. Most of you won't have that (but be thinking of it for next season). Several supplemental protein feeds are available from bee supply companies and none are perfect. To make this recommendation more dubious, bees frequently won't take the supplemental protein if natural pollen is available, but if you want to push the split to grow as rapidly as possible, you need to offer it the supplemental protein. The split will decide if it needs the extra protein.

You can really pump up a split by giving it the occasional frame of capped brood from a disease-free stronger colony. It's hard for me to say how much and how often. If the split is stable and growing nicely and the threat of late season frosts seems to have passed, go with a couple of frames of capped brood in a three to five frame split. If you have concerns, just give one frame about once per week. Where you get the capped brood may be a problem – most logically from colonies you didn't split and that will probably swarm in just a few weeks.

Don't give very much uncapped brood. Uncapped brood requires feeding and nurturing resulting in an increased workload for your little colony.

Exchange positions with a stronger colony

With this recommendation, we are now pushing the colony growth envelope. This procedure can get tricky, but should you have a healthy colony, one that is not particularly large, you can exchange places between the split and the established colony. This procedure swaps field

forces and will pump up the split at the expense of the established colony.

The problem is how much is enough? Too large a colony and you many introduce so many foreign bees that they attack your new queen and do her in. If you have concerns and it is okay to have them put your queen back into her introduction cage and re-release as described above after introducing the foreign field force.

Disease and pest-free

This is common bee sense – but keep all your colonies, both splits and established colonies, as disease and pest free as possible. It would be unlikely that a colony was strong enough to split but was also carrying a heavy mite load. Worse is that you split a colony with a case of American foulbrood for then you have two cases of foulbrood. In any case, watch for diseases and deal with them appropriately.

In Conclusion

With your splits, you have two options – let them manage for themselves or push them to grow. In either case, don't let them become crowded, as they quickly will. Also, I would suggest that you feed sugar syrup to any split until a strong nectar flow is underway. If you choose to really push them, your options are to feed both protein and carbohydrates, give them auxiliary frames of capped brood, exchange locations with another stronger colony, and watch for all threats from diseases and pests. If this process works out well, you will get a productive new colony, headed by a new queen, and you will control swarming in the colony from which the split came. In any event, a shot of good luck always helps. BC

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Grafting With Beeswax

C. Rose Leonard

For millennia gardeners have been grafting fruit trees and flowering shrubs. The invention of grafting has been lost in the mists of time, but ancient Persians painted scenes of trees grafted to supply several kinds of fruit. The ancient Roman Cato wrote a grafting wax

1. Split the stock (bottom of the graft) with a sharp cleaver.

recipe in his "Rustic life" of 300 B.C.

Monasteries and individual beekeepers kept the art alive through the Dark Ages. Some traveled the country selling their mysterious skill to estates with orchards.

As one remote ancestor said, "Bees, trees, fees." Few people ever learned grafting.

Some used a mix of fine clay and cow manure. But beeswax was always more successful.

The aim of grafting wax mixtures is twofold. The first is that the mix does not run in hot weather. The second is that it does not crack in cold weather. But different mixtures work for climates of extreme temperature changes.

For example, an old Vermont grafter dabbed the thinnest possible layer of live beeswax across the union of scion and stock to hold the union. Propolis sealed the cuts and prevented infection. He also used fresh mutton tallow and linseed oil (from his own flax seed) in his grafting wax mixture.

Many greenhouses sell commercial grafting wax. Clark's grafting wax costs about four dollars for four ounces and seven dollars for eight ounces. Clark's grafting wax comes from Connecticut.

Grafting wax is used when clay is too heavy and cumbrous.

Recipes for grafting wax fall into three categories which are as follows:

1. hot grafting waxes
2. hand waxes
3. cold waxes

It is quicker and neater to apply wax with your fingers than a brush if you are only making a few grafts. Use wax that is not too hot. Dip your fingers first in soft soap and water.

The higher the percentage of pitch, the higher the temperature the mix must be. A pitch wax must reach around 200°F A resin wax need only reach 100°F.

Hot grafting waxes, usually applied by brush, are the most popular in the world. In warm climates, the admixture of inert solid should be increased. Bitumen emulsions are most suitable for really hot climates.

2. Cut the scion (top of the graft) into a wedge, exposing the cambium layer.

Cold brush waxes work by evaporation of a volatile ingredient. These mixtures are stored in air tight containers in a cool dry place.

Hand waxes are often used in home grafting. Hand waxes are soft and sticky.

Hot Wax

4 parts beeswax (by weight)
2 parts resin
1 part tallow

3. Widen the stock's cut enough to firmly seat the scions.

Cheaper recipe

4 parts resin
1 part tallow
1 part beeswax
1 part raw linseed oil (never use boiled or treated)

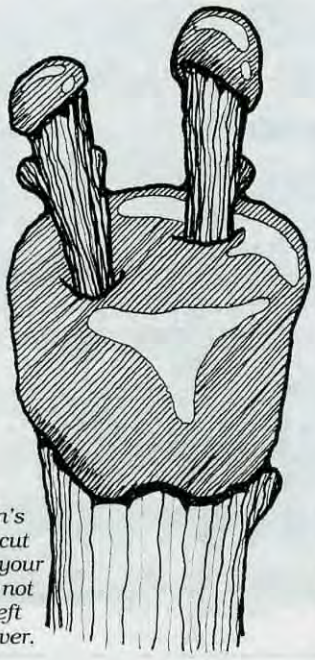
Hard type of hot grafting wax

5 lbs. Of resin
¾ lbs. Of beeswax
1 oz. of lamp black
1-1/2 oz. of fish glue

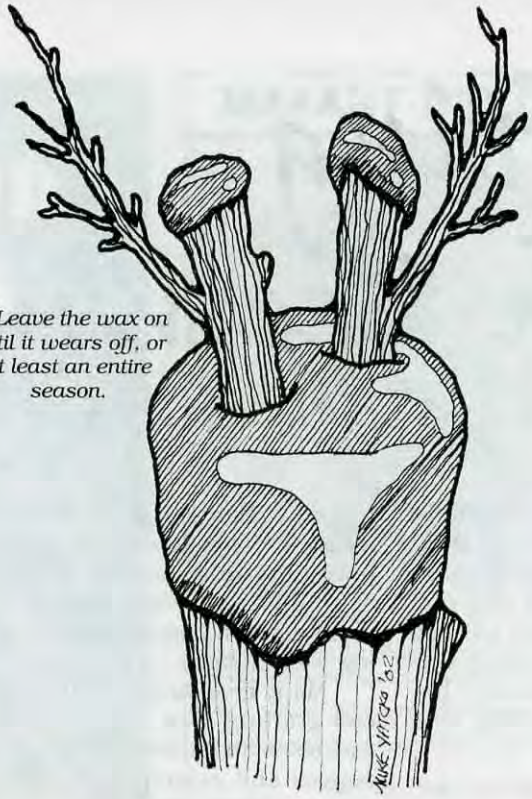
Continued on Next Page

GRAFTING ... Cont. From Pg. 29

Heat the glue in a double boiler with just enough water to dissolve it. Melt other ingredients in another container; allow to cool, but remain fluid. Add glue and stir continually. Pour into greased *pans*. Let harden. Chip it when ready to use. Re-heat and apply with small paint brush.



***4.** Seal the scion's top cut, and the cut on the stock with your wax sealant. Do not fill the entire cleft with wax, just cover.*



***5.** Leave the wax on until it wears off, or at least an entire season.*

Cold Wax
All depend on evaporation of a volatile compound.

2 lbs. of resin
1 lb. of beeswax
¼ lb. of talc
½ pint of methylated spirit

Melt resin, add beeswax. Remove from heat. Add talc, stirring continuously. Remove vessel from fire or naked light! While warm, add methylated spirit. Store in air tight container in cool place. Apply wax with a stiff brush.

Hand Wax
4 parts of resin
2 parts of beeswax
1 part of tallow

Another hand wax recipe
4 parts of resin
1 part of beeswax
2 parts of tallow or linseed oil

When melted, the mixture is poured into cold water and hand worked, grease hands to prevent sticking.

Yankees developed many grafting methods for different problems. For example, pioneers often "top grafted" scions of tasty apples on trees of more vigorous stock growing wild in the fields.

Grafting technique developed even more during the 1920s to increase the sale of hybrid tea roses. Those which produce giant roses are grafted onto rootstocks which provide lots of nutrition to the graft.

Another group which has provided fascinating information to grafters are the Japanese. The graft of Japanese tree peonies challenges us all. The two tone, gold and purple moutons are grafted onto the roots of the more common pink tree peony.

We have all lost hybrid tea roses to hard Winters. The rootstock of a dark red, June-blooming rose survives.

Grafting enables us to preserve strains lost to the nursery trade. You can buy new rootstock from Mellinger's Nursery in Ohio. Mellingers also carries interesting grafting aids. Other grafting supply outlets can be found at www frostproof com www wilsonirr com www.trequest.com BC

C. Rose Leonard grafts plants and raises bees from her home in Punxatawney, PA.

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HONEY HOUSE EFFICIENCY

Allen Summers

Entrance to honey house building dimensions, 26 x 35 ft. Left side, Loading & storage, right, honey processing.

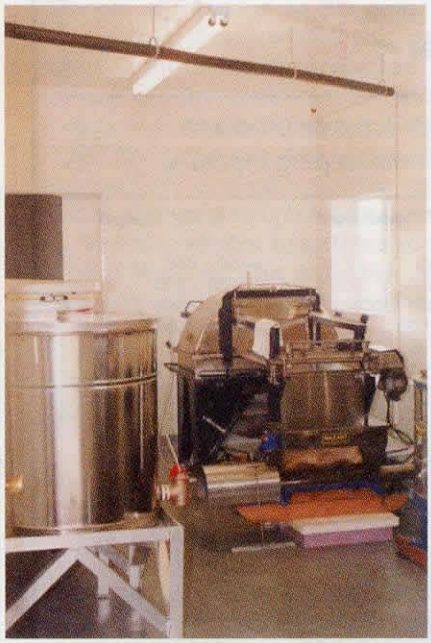
I first started keeping bees in Southern California about forty years ago, and I remember that extracting equipment and facilities were quite different than what we consider state of the art today. I had the opportunity back then to see several large commercial operations as well as hobby equipment that was available. The commercial guys, by and large, were using either large Hubbard or Woodman extractors with capacities of sixty or more frames. One commercial beekeeper, Gil Soffel, had a large Hubbard extractor that held 120 frames per load. His son, Ron, who now runs bees commercially, still uses the same extractor today. At Miller's Honey Company where I worked in the early 1960's, we used several sixty-frame Woodman extractors. Woodman Manufacturing was bought-out by Dadant & Sons a little later-on in the middle 1960's. Interestingly, with such large extractor capacities, we were uncapping mainly using "wiggle" or vibrating knives made by Woodman or Root, and at times additionally using hand-held electric knives when there was a lot of uncapping to do. Steam heat was used for almost everything from melting wax to heating knives to cleaning up afterwards. Every commercial producer/processor had a steam boiler of some type, large or small, connected to their operation. McKenna Boiler Works, being located in nearby Los Angeles, continues to this day to supply a large number of commercial processors.

Incoming supers and filled containers are weighed on a 50-year-old rebuild platform scale.

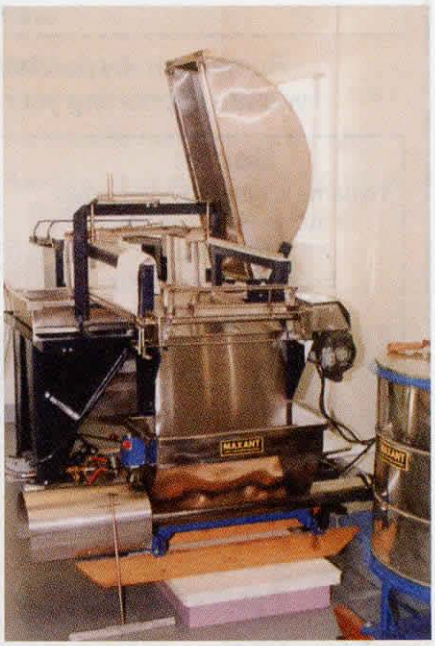
Warm room (door opened) keeps supers just right for extracting, 90°F and 45% relative humidity with heater and humidifier in any outside weather conditions.

The limitation on production then was not from extractor capacity – one could simply add another extractor or change over to one with a larger capacity – but upon how much and how fast we could uncap to keep the extractors loaded and running. These operations were labor-intensive, requiring several people to do uncapping and keep the extractors loaded and unloaded, but labor was relatively cheap, paying minimum wage, at the time.

After the middle 1960s, we started seeing some significant time and labor-saving improvements in equipment. Probably



General view of extracting set-up: Spinner, far right, Cowen 18 frame extractor w/Maxant auger, front. Overhead, black insulated pipe runs from honey pump to storage/bottling tanks, left in picture.



Extracting set-up: Spinner, right front, auger, front, uncapper above that and open Cowen extractor.

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Parts Of A Modern Hive

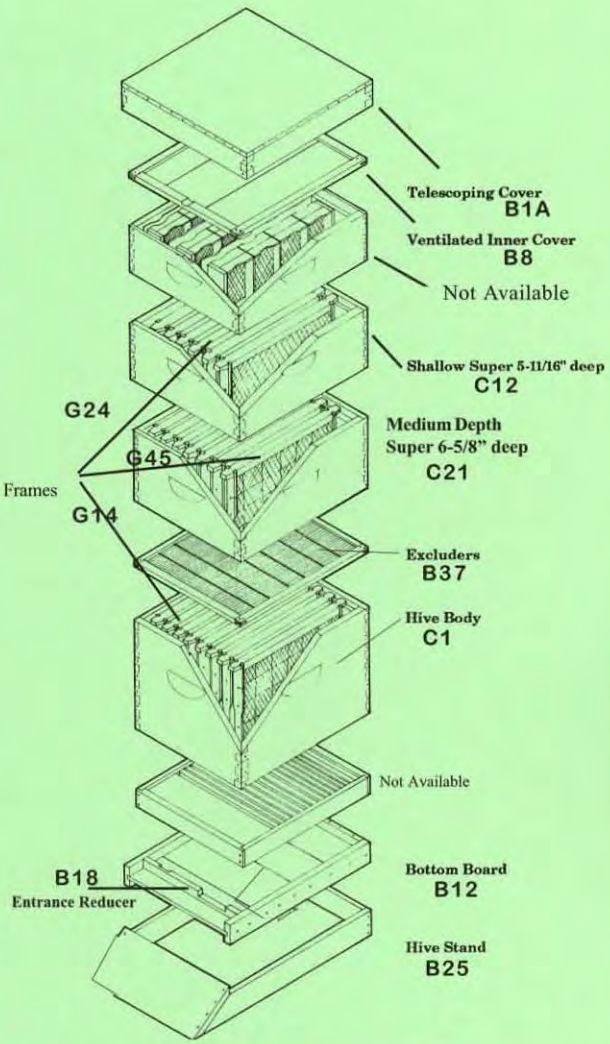

Diagram for Description Only

A1 Standard Hive includes bottomboard (B12), deep super w/ frames (C1F), metal cover w/inner cover (B1). No foundation included, will need H21, or H8B. Comes unassembled, nails included.

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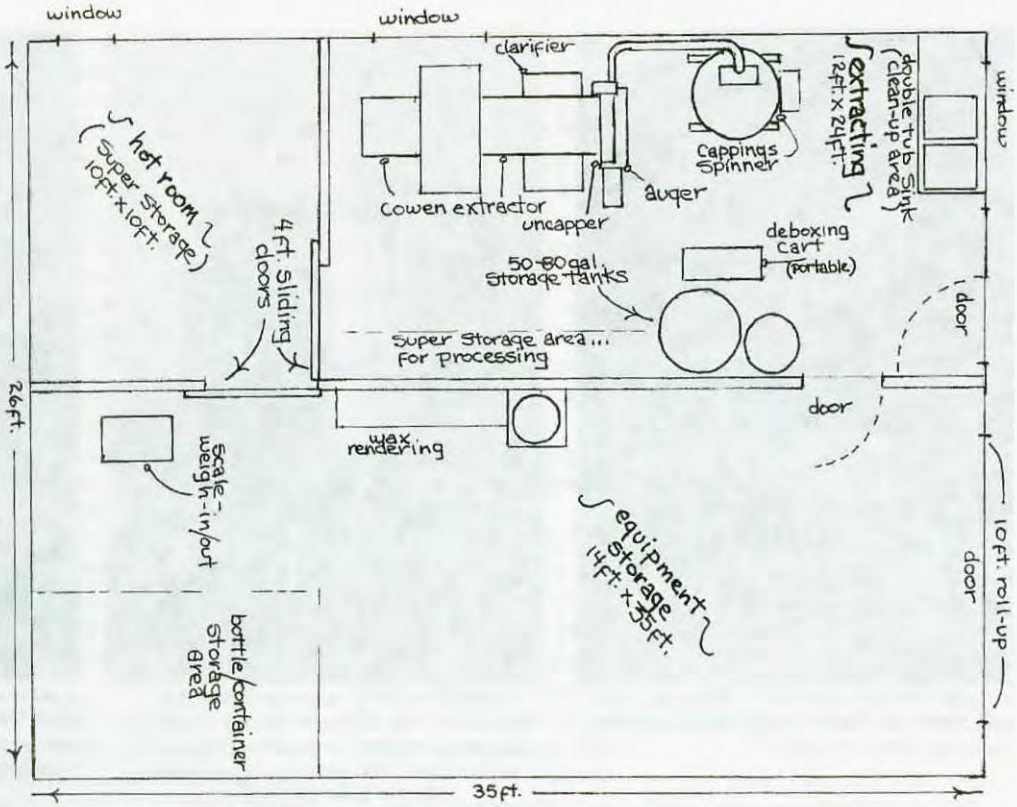
Medina, OH 44256

due to factors such as: decreasing numbers of beekeepers, competition from sugar and other sweeteners, and more strictly enforced labor laws; efficiency and labor savings become more desirable and necessary. A major time-saving improvement around this time was the development of the automatic uncapper by John Cowen in Parowan, Utah. Instead of the extraction process being limited by the rate at which we could uncap, the Cowen uncapper enabled us to not only keep-up with the extraction process, but to exceed the rate at which we could keep the extractors loaded and unloaded. In comparison, with a hand-knife one can uncap about one frame per minute; with a vibrating knife (one blade) about two or three frames per minute; the Cowen uncapper can uncap up to *seven to 10* frames per minute, depending on model. Several other automatic and semi-automatic uncappers have come out over the years, such as the Bogenschutz, Maxant, and Dakota Gunness, the last two being flail types, rather than knives. There are advantages and disadvantages to each type, the selection of which seems to be determined by personal preference and the size of operation. Something they all share in common though, is that they significantly increase uncapping production and efficiency.



By the early 1970s, it became obvious to commercial operators that the limitation in extracting efficiency was not necessarily with the various components such as extractors, uncappers, and cappings/wax handling systems. They could all work quite efficiently as separate units. The major limitation was with the synchronization and amount of labor required to transfer frames and product from one piece of equipment to the next.

Loading & unloading extractor (done in one motion). Uncapper, front (cappings fall into auger below) 18 frames in, 18 frames out.

Detail of uncapper, auger below, and feed pipe rear to spinner.

15 gallon Maxant clarifyer extractor, left and spinner, right (out of picture) drain through screen. Note quick-connect "c lock" on hose which facilitates cleaning.

Continued on Next Page

15 gallon Maxant clarifier. . Extractor, right, spinner, left drain through screen. (Float switch on front of tank.)

Rebuilt maxant cappings spinner w/ variable speed DC motor (facilitates easier cappings removal & greater honey/wax separation). PVC pipe top loads, honey drains back to clarifier.

A good sink helps greatly to keep things free of stickiness. Here, a two compartment (which will accomodate two supers if necessary) and very useful spray attachment.

Around this same time, Max Cook of Loupe City, Nebraska, and John Cowen, mentioned previously, developed the Integrated Parallel Radial Extractor. The Cook and Beals systems are built primarily for large commercial operators, whereas the Cowen systems additionally cater to small side-line operators. The ingenuity of the Integrated Parallel Radial concept is that it allows an operator to load and unload the extractor in one step, thereby eliminating the need to handle and re-handle frames. The bottleneck in the extracting process is no longer determined mainly by how fast one piece of equipment works, related to another but rather, on how fast an operator wishes to work. Compared to the older, conventional extracting systems, the Integrated Parallel Radial systems allow one person to do the work of several people in the same or lesser amount of time. For example, it may take, on average, one person an eight hour day to hand uncap and extract fifteen supers of honey using conventional, multi-frame equipment. With a semi-automatic uncapper and Integrated Parallel Radial system, one person can *easily* process that amount in one-half or one-third the time, working at the same pace. With my current 18-frame Cowen system, which has a manually-operated two-blade vibrating uncapper, I can easily process three to five nine-frame-supers per hour. (Times vary according to how much burr comb and propolis needs to be cleaned off of frames.) The time and labor savings with these systems is significant. Also, as I grow older and less inclined to do the physical work of a twenty-year old, I appreciate the labor savings.

Inevitably, questions arise when describing these systems, as to the higher costs of acquiring them. It is a mistake I feel however, to equate price alone with practicality, or with longer-term cost benefits. Many beekeepers extole the virtues of economy and frugality above most others and, within certain restrictions of financial and labor resources, their comments seem reasonable. The cost/benefit ratio as I see it, however, depends primarily on two things: how much one's time is worth and, how much one actually saves by scrimping on initial investments. I love beekeeping and its related activities, such as honey and beeswax processing, otherwise I probably wouldn't continue to do them after all these years. But I feel that they are just a few of many activities that require my time and attention. Therefore, the old adage, "penny-wise, pound foolish" seems good to remember, when it comes to beekeeping equipment purchases. For example, it is more efficient and economical in the longer run for me to recycle (read: throw in kindling pile) old, used frames and build new ones, than it is for me to spend the extra time cleaning and reusing them. One really needs to evaluate what the value is of their time and other responsibilities, I feel.

Our Current Extraction Set-up

The extraction system/set-up shown in the photos, corresponds to the way in which we like to handle our honey and beeswax. We prefer to not heat honey beyond normal hive temperatures, therefore, we usually keep processing temps between 85° and 100°F At these temperatures, the honey flows well and passes readily through straining screens, and pumps easily. For the sake of simplicity and ease of maintenance, we use electrical heat for everything – knives, clarifier, wax melter, etc. Using a steam boiler or hot water recirculating system would have been more costly for us to run and maintain. We market and sell our honey "aunatural" which our customers prefer, and which commands a higher price. The only way we can deliver consistency in this state, is by watching temperatures

carefully. Fortunately, here in Colorado, moisture content of our honey is usually low – about 15-18% due to the dry climate, so we don't worry about fermentation.

Many commercial operators use Brand-type wax melters because they are fast, simplify cappings handling, and do actually produce some very nice quality rendered wax. But the honey that is also processed is not comparable in grade or quality to that coming from the extractor, and we would not want to mix that with our premium honey. Even though the process is more labor-intensive than using a Brand type melter, we use an auger to catch the cappings, and "push" them to our cappings spinner, which then separates the cappings from the honey; this way, we retrieve all the honey unheated (practically speaking) which can include 10-15% of the total amount coming from the spinner. Spin-dried cappings are later melted and purified, using a Maxant cappings melting tank. We have a market for our premium cappings beeswax, which we sell in blocks and cakes. It seems that a lot of people, particularly from "old-world" European and Asian cultures, buy our products because they are familiar with the more natural, unrefined products.

Finally, but not necessarily in the order of our processing set-up, we have a temperature and humidity controlled "hot room" to hold supers before extracting. In Colorado especially, we really need a hot room as we are frequently extracting into the month of November, at which time outside temperatures can be consistently below freezing. We keep our hot room at around 90°F with 45% humidity which is close to natural hive conditions, keeps the honey from granulating, and provides for easy extraction. Having a hot room eliminates the rush to get done before cold weather sets-in and cuts down on heating costs for the extraction facility itself. Our current honey house is still in the process of refinement, and I would like to redesign our cappings recovery system, so that it is more efficient than at present. Cowen Manufacturing has talked about making a smaller version of their cappings spinner which unloads automatically and would be ideal for us or any smaller processor. I'd also like to devise a more efficient way of lifting and handling full supers, and I've had my eye on one of the newer Nassenheider bottling systems, too.

In keeping with the ever-changing honey market and challenges for beekeepers in general nowadays, I feel that our facility reflects a practical effort to remain viable and grow along the lines of value-added marketing. The "good old days" are pleasant to reminisce about occasionally, but we feel that the reality of the present requires us to implement practical and efficient procedures. BC

Al Summers efficiently extracts his honey in Longmont, CO.

Richard Taylor

Bee Talk

"The Cross Hive"

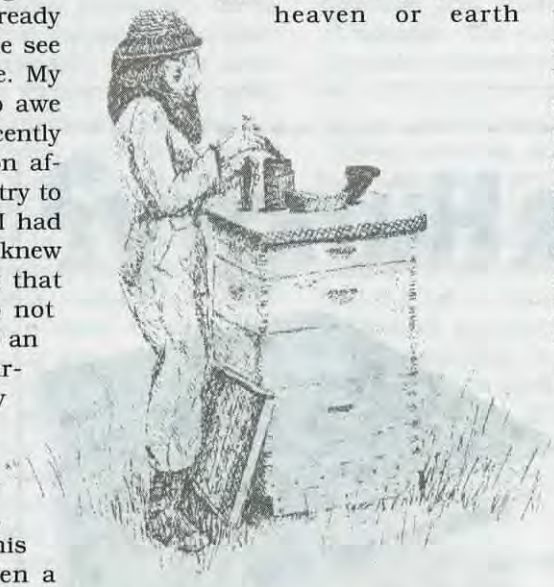
Reprinted From *The Joys Of Beekeeping*

Everyone can recall certain moments that were turning points in life. The moment of my first bee sting was surely one of these – not just because I had been stung, even though the immediate consequences of this turned out to be rather horrendous, but because the fates had somehow put me in the proper frame of mind for it. From that moment my attitude toward bees, and their stings, has been essentially what is required for the art of beekeeping.

I was still young but had already sensed that the hostility people see in nature is born of ignorance. My love for nature had turned to awe and amazement when I had recently beheld my first beehives. Soon afterward I went out to the country to call on an ancient beekeeper I had heard of. About the only thing I knew about bees at that point was that they will not sting if you do not bother them; and this was less an item of knowledge than an article of faith derived from my general attitude toward living things.

I found the beekeeper, very old and crippled by arthritis, and he took me at once to his apiary. There must have been a dozen hives. I had never seen so many bees. Striding dauntlessly up to them, in the steps of the old man, and like him without any veil, I did not wince as I felt a sting on the very top of my head. I somehow had the faith that the bees would not attack me if I approached them in the right spirit and that this sting was some sort of accident. I was right about that, for there were no more, but within a half hour my entire body, to my toes, was covered with brilliant red blisters, and I hardly made it home and into a bathtub before my eyes refused to open. For several days I wore a face that rivaled that of the ape. The experience seems only to have reinforced my determination to become a beekeeper, and in any case, those miserable initial effects have never been repeated. A sting now, even to the eyelid or lip, produces the same sharp pain and the same expletives, but no swelling.

Every old-time beekeeper can tell about the cross colony he once had that no power of heaven or earth could subdue. Such a colony is not usual, but is encountered sometimes. It violates every principle of apiculture. A puff of smoke only rouses it to greater fury. It is invariably a colony under stress – one that has just lost its queen, for example, or one that has been robbed of most of its honey.



My own encounter with such a hive is unforgettable, although I have to admit now that the anger of these bees was provoked by my choosing an inappropriate time, during a dearth of nectar in the fields, to take their honey. This hive did in any case teach me a lesson about that, and it dispelled conceit that with skill and the right approach I could manage any colony of bees on earth.

I arrived at daybreak in the yard where this colony stood, thinking I could get my work done before the heat of the day. The deep red of the rising sun warned that the day would be hot and therefore ill-chosen for work in a bee yard. And indeed it was hot, even before the sun was very high. When I saw a grasshopper in front of my nose, *inside* my veil, I should have interpreted it as an omen and left the work for another day. Things went all right for a while. I was using a bee blower and had about forty supers off the hives and loaded when off came the cover of the cross hive, which had never been particularly cross before. It was as if they had been observing my approach for the past hour with mounting fury.

Every beekeeper can imagine the scene that followed. The bees rose from the open hive in a cloud. My shirt, already plastered to my back with perspiration, was quickly stitched down as if by a thousand needles. A few bees even managed, miraculously, to pass through the wire mesh of my veil. This unsettles the nerves of the most stoical beekeeper. I got the hive back together, gathered up my equipment, and with elephantine grace got myself away from there, observed with profound curiosity by a young field hand not far away. Glancing over my shoulder as I fled, I noticed that the field was suddenly empty, the field hand having evidently moved with approximately the speed of light from the center of the field to its periphery.

And sure enough, there he was, off to the edge, his shirt off now and twirling slowly, like a windmill, in front of him. I didn't ask any questions. My faithful old dog, who always accompanies me on my bee trips and who has never failed to respond to my call, did not appear this time. I became convinced that her brave heart had finally given out, that a thousand bees were now stinging her lifeless body in some forsaken place where she had vainly sought safety. Actually, she was eventually found, stretched out comfortably by a cool spring in a darkened cow barn nearby, oblivious to the fierce bedlam of the world outside.

That evening my dear wife was shocked to count the stings I had received. I could have told her where she might have found a few more. The prettiest twist to the whole episode came about a week later, however, when I returned to find this same colony now fairly good-natured, and to learn that the young field hand, whose eyes, I was told, had been swollen shut for two days, had decided he wanted to raise bees himself, was eager to learn more about them, and wanted me to give him lessons! Well, he seemed to have gotten through the hardest lesson with good grades. He moved away soon after, however, and our paths have not crossed again. Perhaps he is now keeping bees.

I wrote to the bee supply company that night for a complete bee suit with zip-on veil, an item that had always been considered the necessary uniform by female apiarists of my acquaintance. This brought to a full circle my own philosophy about stings. That philosophy had begun with a scorn for even a veil and with the conviction that stings are the reward of the clumsy beekeeper. Perhaps one gets less heroic with age, but I generally use my bee suit now, with its zipper veil that no bee can penetrate and the ventilated leather gloves I bought at the same time. Now I do sometimes spend an entire afternoon with the bees without a single sting. Cowardly or not, it seems good.

Still, I know that as long as the bees are such a part of my life, which will surely be to the end of my days, there will be plenty more stings. It is worth only so much to try to avoid them. BC

Richard Taylor is a long time philosopher and beekeeper. Don't miss the opportunity to visit with him this year at EAS 2002, at Cornell University in Ithaca, NY.

Queen Introduction
Things To Consider

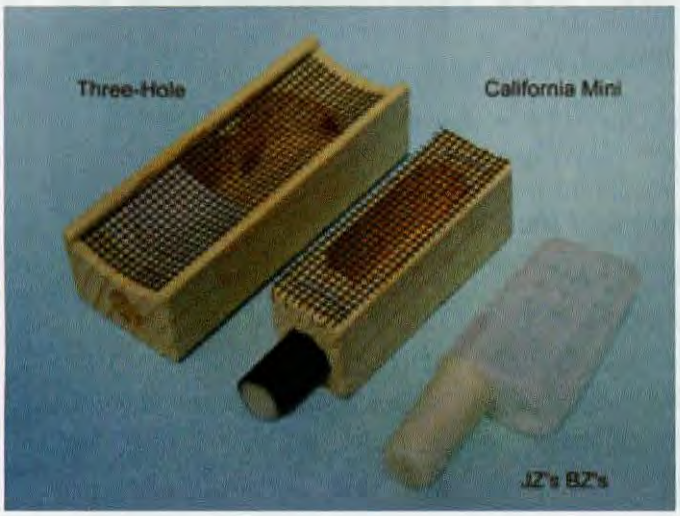
Joseph Latshaw

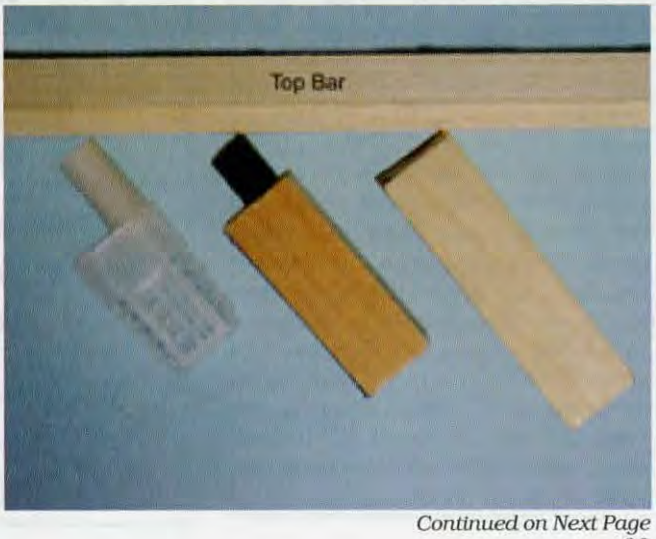
How many beekeepers have received a new queen in the mail only to realize that their work has just begun? Each year thousands of beekeepers find themselves in such a predicament. A new queen arrives in the mail, and now you must make a split or find and remove the old queen to make room for the new queen. Well, here are some of the basics for requeening and queen introduction based upon our experiences.

What is the best time of year to requeen? There are many suggestions as to when is the best time to requeen, and as with any beekeeping question, ask 10 different people and you will likely receive 10 different answers. However, there are a few guidelines that may help you to make a decision. Spring is always a beautiful and productive time of year for beekeepers and bees alike. Commercial queen producers are in full production, ready to meet your requeening needs. Some of the benefits to Spring requeening include queen availability, many producers are able to ship this time of year; small colony size, most colonies are at their smallest size early in the Spring which makes finding queens a little easier; and finally conditions are very favorable for queen introduction as the new queen will have plenty of support for her new offspring.

Availability is an important issue to consider. While your schedule is important, you must also consider when you can obtain queens in your area. Many queen producers begin grafting in late February or early March. It takes approximately 24 days from the time a queen producer grafts until mated queens will be available for shipping. Keep in mind this process may be delayed due to poor weather conditions, so plan on a reasonable time to receive your queens. If you order your queens too early, you may be faced with a situation of poor weather conditions in your local area when it comes time to introduce your new queen. Finding queens in a Spring snow storm is not an enjoyable task!

Finding queens can be a challenging task, so why not minimize the trouble? In the Spring and early Summer, the colony population is often less than what you might expect in the Fall. In addition, the colony is quickly replacing the old Winter bees with a healthy crop of young bees. This is not a critical point, but consider your queen finding skills, the fewer bees you have to search through, the better. A helpful suggestion for locating queens in large colonies is to take a couple of queen excluders and place them between the various boxes about a week before you will need to locate the queen, if you allow your queens to run in more than one box. This way, you only have to search for the queen in the box that contains the eggs and larvae when you return to locate the existing queen. If the searching fails, you may wish to resort to extreme measures such as shaking the bees from the box containing the eggs and young larvae through a queen excluder. Place a queen excluder over the top of the hive and place an empty box on top of the excluder, so you will have something to shake the bees into. If all goes well, most of the bees will move through the excluder down





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QUEEN ... Cont. From Pg. 39

into the colony and the queen will be found crawling around on the excluder or in the empty box.

Now that you have decided on a time of year to requeen and have worked out a plan to locate the existing queen, what do you do about introducing the new queen when she arrives? There are three main types of cages that come to mind when I think of purchasing queens through the mail, the traditional three-hole cage, California mini cage, and JZ's BZ's plastic cage.

The photographs indicate the position that we use to introduce the queens into their new colony. Two suggestions that apply to nearly every style of introduction are to always place the candy end up and place the queen cage in an area that is well supplied with bees, preferably between two brood frames. The reason for placing the candy end up is to prevent any dead attendants from sticking to the candy, which may restrict the access of the surviving attendants and the queen to the candy. One or more of the attendants in the queen cage may die, and if the candy end is placed down, the dead attendants will fall to the candy end of the cage and cover the candy.

When it comes time to place the queen cage in the new colony, some beekeepers suggest poking a hole through the candy using a small nail or wire. If the candy is fresh, I do not see any need for this step. I actually suggest that you place the new queen in the colony with the candy end covered, or protected from the bees in the colony. Give the bees 2-3 days to get acquainted with each other, then come back and remove the cork or other covering from the candy end of the cage. The bees will then chew through the candy and release the new queen. The reason for the extended release period is that with some of the new cage designs, the bees are able to chew through the candy in twenty-four hours or so, which in my opinion, is not enough time for the queen to become acquainted with her new colony. When you come back to remove the cork or other covering, you may also want to check for and remove any queen cells the bees may have begun to construct.

What About The Attendants?

Recent research indicates that queen acceptance in a colony is better, and faster, if the queen is alone in her cage. Removing attendants can be tricky the first few times you attempt it. It is easier with the three hole and California mini as the screen can be partly removed. JZs cage can be opened, though, and workers released. Open any of these in a closed room, preferably with a window. A queen released in error will then go to the window and can be recaptured and returned to the cage. Working in a truck cab or car, windows closed is also effective.

After removing the cork and checking for queen cells, let the colony rest for a week. This will give the new queen time to get out and begin her egg laying duties. It will also give the colony time to readjust and get back into its routine. When you come back after a week has passed you do not necessarily need to find the new queen, but you will want to be sure to verify that there are plenty of new eggs in the combs.

Hopefully this will provide you with a few helpful tips the next time you decide to requeen one or more of your colonies. Remember, there are many successful ways to requeen a colony if you follow a few simple guidelines to ensure that it is in fact a success. Good luck and happy beekeeping. BC

Joe Latshaw operates Ohio Queen Breeders in Columbus, OH, and has successfully introduced thousands of queens.

You Promised An Exhibit This Year!

Ann Harman

Now is the time! Right now. Before you know it, county and state fairs will be here and you promised them an exhibit this year. Beekeeping exhibits fall into two types: the Display – essentially a display of honey or hive products and the Educational Exhibit – designed to give information.

Displays of honey or hive products really had their day in the 1920s through 1950s. Photographs from that time showed massive arrangements of honey of all kinds, sometimes accompanied by beeswax candles or other hive products. This type of display will be addressed in another article.

The more important type is the Educational Exhibit since its purpose is to educate the public about bees or some aspect of beekeeping. Some of these exhibits are impressive and some are abysmal. Let's see what can be done to make a really good exhibit – one that beekeepers and associations can be proud of, and one that will truly benefit the visitor.

Educational Exhibits themselves actually fall into several categories: a one-time exhibit at a fair, an exhibit at some public place such as a mall, and a traveling exhibit – one that folds up, packs away and can be carried from place to place to be used a number of times.

To start off, here is a little test for you:

How long does the average non-beekeeper visitor to the exhibit spend at your exhibit?

a. Seconds
b. Seconds
c. Seconds
d. All of the above

Yes, it is true that very little time is spent looking or reading at any single exhibit. After all, at a fair parents with kids are being pestered to go to the midway if there is one or to get a hot dog and cotton candy. Dad wants to go home and Mom wants to see the quilts. You've got competition for their time at the fair.

This year at the fair take some time and see just how long visitors stop at any exhibit on any subject. Take a walk yourself and see what exhibits grab your attention and cause you to stop, and also which ones do not seem to be worth looking at. Analyze both—to learn from successes and failures.

If a beekeeping association is making the exhibit, planning for it now is essential. A good exhibit is made by taking all sorts of ideas and plans and then throwing most of them away – or possibly saving some idea for the following year. Then comes the actual making of the exhibit – gathering the items and actually constructing the exhibit.

Step one is finding out just how much space you will have. Don't be afraid to ask questions of the organizers: Is there a limit on height? Can you use the floor? Is the floor carpeted? Are you confined to a table top? Length, side to side? Width, back to front? Visible on all sides? Barriers to keep visitors from touching or picking up handouts? Is an easel permitted? Does the exhibit have to have someone in attendance? Is an observation hive appropriate? What kind of lighting does it have? Length of time – that is, one day, one week? Who are your "neighbors" in the exhibit hall? Can you drive there? How big is the door? When do the doors open? Even if you visit in person, make a list with all these (and probably more) answered.

Once you have those details, the next part of the project is to select a theme. More questions: does the particular fair have a theme for the year? Can that be adapted for bees or beekeeping? If there is no central theme or has one that is not suitable then you can pick your own. A theme. One theme. So many exhibits end up giving so many messages that there is no message, just a hodgepodge of facts. The visitor really will not receive useful information if they have to sort it all out.

So you have thought of a theme: pollination. No, that is not one theme. Narrow it down. Pollination of what? Apples? Pumpkins? Onions? Local pollination – pertinent to your area? What pollination does for food crops? Why use bees? Or perhaps you thought of honey as a theme. Wow – there's a big category. Honey from flowers (many people think honey bees make honey from pollen). How to get honey out of the honeycomb (extracting). What makes honey different colors or flavors? Why do bees make honey? Why do we eat honey? How is honey used in the home? You can think of many, many more examples. Remember – *one theme.*

You get the idea. Whatever theme you have thought of initially, think again. Can it be broken down into one simple subject that can be presented and understood during those seconds the visitor spends at the exhibit?

In case you are wondering, some themes should never be chosen because the message can be misinterpreted by the public. Diseases of honey bees is one. The public can easily read into this that diseased bees may make diseased honey and pass their disease on to humans. Don't bother saying bees can't do that. The visitor may never get to that point in the exhibit. Drugs or chemicals used to control disease or mites will cause some to think

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DISPLAY ... Cont. From Pg. 43

that honey may be contaminated with the stuff. The internal anatomy of a honey bee has nothing to offer the average non-beekeeper. The public is afraid of being stung, so avoid stings as a theme.

Now that you have chosen the theme it is time to plan how this will be presented. Here the magical word "KISS" – Keep It Simple, Stupid – should be kept in mind. I would like to add to that statement: don't make your exhibit tacky looking with badly made items or poor photos. A cheap plastic pumpkin looks exactly like a cheap plastic pumpkin. A 4" x 6" photo is too small to convey information in an exhibit. If your budget is limited and you cannot present the chosen theme successfully, go back and rethink your theme.

The planning and making the presentation will take time. That is why now is the time to gather thoughts and items. Let's go back to the tacky plastic pumpkin. Suppose this exhibit is scheduled for late June and no real pumpkins are available. Resist the temptation to use the plastic pumpkin. Perhaps someone in your association is artistic and can make a paper mache pumpkin. Let the rest of your items blend with that type of construction or change the approach to your theme so you do not need a pumpkin.

While you are gathering items, keep in mind the scale of your exhibit area. If you have a floor-to-ceiling space that is also wide and deep, will a one-pound queenline jar of honey really show up? No. Try a two-pound jar or, a bunch of jars. Cases of them maybe. Perhaps you have only a tabletop space, three feet wide. There an 8-ounce jar will be more appropriate. While we are thinking about items for the display, keep in mind that size is important but number of items is just as important. What will be the fewest number of items that will convey your message? It is better to fill your space with a few things that are large than many items that are too small to recognize quickly?

Oversize items – bigger than real life – command attention. Choose paint colors that are brighter than real life. A 3-foot wide bright yellow sunflower or a 2-foot high clover blossom will be appropriate for a large space. Scale down for a tabletop but keep the colors bright.

So often the background for exhibits gets ignored. Look around at some exhibits. White is so common. Could your exhibit attract attention if the background were a bright green or red or yellow? Keep the background plain. Cloth with bees on it looks cute but is entirely too "busy" to display your message.

In this day of computers, there is absolutely no reason for hand-lettered signs. But keep away from those fancy fonts that are difficult to read. Letters in a script font can be impossible to read. Crazy shapes are just as bad. What is wrong with a simple, straightforward shape? While we are talking about signs and messages, do not think for a minute that anyone is going to read a page of text explaining some detail. Think six words or less. Really, it can be done. Your goal is to have the visitor *remember* a very few facts. Those are best conveyed in a few words. How about: Bees make honey from nectar. That's five words. That is enough for one sign. You can think of the next sentence after that one.

What size type? Much, much larger than you might expect. Go ahead and type the sentence "Bees make honey from nectar." in a size you think appropriate. Tape it to a door and stand back at least six feet, or more. Is that sentence immediately legible or did you have to stop and try to see what it says? By the way, the most visible signs are black letters on white background. Use color elsewhere in your exhibit.

When you have made a rough draft of your signs, look at them again to see if you have used beekeeper words that only a beekeeper would understand. Substitute those with something simple in ordinary English. Even such words as "frame" mean something else to the non-beekeeper. We talk about "cappings" or "capped honey," but we are beekeepers and those words make sense. Unless such terms are explained to visitors, they convey no information, only puzzlement. Oh, by the way, check your spelling. Then, check it again.

Handouts are important. These do not have to be extensive; one-third of a sheet of paper is quite adequate. You may wish to have information on where to buy honey or perhaps a description of the different honeys available locally. You may wish to inform visitors about beekeeper associations, both local and state. A second handout should be a recipe. Choose one that is quick and easy such as a barbecue sauce or a simple sauce for ice cream. On this handout you might wish to give a source of more recipes.

These handouts must look professional. Computers make this possible. Take some time with setting up your text. It is better to use some of the ClipArt programs than a poorly hand drawn illustration to decorate your handouts.

You may have a small budget for this exhibit. Just plan to do some begging. For big sheets of cardboard, visit a large appliance or kitchen cabinet supply. Take a jar of honey with you and explain why you need them to save a big cardboard box for you. Need some lumber? Take a jar of honey and find a house being built. Weird pieces and leftovers may be just what you need. If you end up borrowing something return it undamaged and with a jar of honey for thanks.

Your organization can obtain the set of Study Prints from most suppliers. Actually those are useful in short courses, teaching beginners, as well as decorating an exhibit. The photos are excellent and they are large, easy to see. Select ones that fit your theme and make explanatory signs. If you choose to use photos of your own or from your association, take note of the size and clarity of the Study Print photos. Yours should be as good.

Your exhibit will turn out to be spectacular if you just plan ahead (difficult) choose a theme the public needs to know about (not so difficult) and remember KISS (easy).BC

Ann Harman is a sideline beekeeper and international marketing consultant.

?DO YOU KNOW?

Honey Bee Products

Clarence Collison
Mississippi State University

Honey bees are best known for the delicious honey they produce and for their valuable service to agriculture through their pollination activities. There are several other useful products associated with colonies that are not nearly as commonly known. Included in this list would be beeswax, propolis, pollen, royal jelly and venom. Whether you are a hobby beekeeper, sideliner or commercial beekeeper, it is important for you to gain an understanding of products other than liquid honey associated with the hive.

Please take a few minutes and answer the following questions on this important topic.

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

1. ____ Wax scales are removed from the wax pockets by the bees producing them.
2. ____ Propolis as it is collected by bees, like pollen, comes in different colors.
3. ____ Beeswax is an extremely stable material.
4. ____ Beeswax is brittle at low temperatures.
5. ____ Fat-soluble acaricides are being preserved in beeswax for many years.
6. ____ Blocks of beeswax and comb foundation maybe stored for years if the storage conditions are proper.
7. ____ Beeswax combs used in brood rearing become darker in color and heavier in weight with use.
8. ____ Many varroacides can be found in wax foundation currently found on the market.
9. ____ Batiking is a method using beeswax to make bronze or other metal castings.
10. ____ Beeswax is secreted as a fluid and rapidly hardens into wax flakes when it is exposed to the air in the wax pockets.

(Multiple Choice Questions, 1 point each)

11. ____ The major chemical component of honey bee venom is:
    A. apamine
    B. mellitin
    C. mast cell degranulating peptide
    D. phospholipase A2
    E. hyaluronidase

12. ____ The component in royal jelly that exhibits antibiotic activity against many bacteria and fungi:
    A. nucleic acids
    B. B vitamins
    C. 10-hydroxydecanoic acid
    D. vitamin D
    E. Vitamin C

13. ____ Beeswax melts at a temperature of____:
    A) 170°F
    B) 132°F
    C) 112°F
    D) 120°F
    E) 145°F
14. Name four mechanisms which can lead to residues in honey after treating a colony with acaricides. (4 points)
15. Name two factors that inhibit an aerial cluster of bees from building comb. (2 points)
16. In addition to beeswax, what other materials are involved in comb construction? (2 points)
17 What is slumgum? (1 point)
18. Currently what is the largest commercial use of honey bee venom? (1 point)
19. Beeswax candles are usually made by one of at least five methods; name two of them. (2 points).

ANSWERS ON PAGE 55

EXOTIC SOAPS

Using Honey & Beeswax

Christina Spence

Recipes Included:
- Easy Milk 'n' Honey Soap
Old Fashioned Pure Honey Soap

More and more consumers are looking for handmade, all-natural toiletries to use instead of the harsh commercial counterparts usually offered. Soap in particular is enjoying a surge of popularity, as people look for more natural and unusual types to use. These two honey soaps are proof that soap can be something very special. And, as a beekeeper, they can prove very profitable when added to an existing inventory of products.

HISTORY OF SOAP

The Romans are generally credited with being the first to develop soap. One interesting theory as to how soap was first discovered is based on the women in Rome who would wash their clothes at the Tiber River, at the bottom of Sapo Hill. Sapo Hill was known as a famous worshiping site, where a variety of different temples were housed. Legend has it that as the animals were sacrificed at the temples, the ash from the fire, and the grease from the animals ran down the hill to the riverside. These are the basic components of saponification – or the chemical reaction that occurs during soapmaking. The women that washed in that section of the river quickly noticed that their clothes were cleaner than anyone else's, and thus began the life of soap.

Thankfully, though, we have a much easier time making soap in the 21st century! We don't have to wait around by the edges of rivers and wait for temple drippings from above. With a minimum investment you can create high-quality bars of soap that your customers will grow to love.

TWO METHODS OF SOAPMAKING

Melt and Pour

Melt and pour soap is a fairly new phenomenon. It is an excellent choice for beginning soapmakers who want to create a quality soap without having to invest as much time, energy and money into getting all the necessary equipment and supplies needed to make traditional soap.

Melt and pour soap consists of melting down a soap base purchased from a supplier, and then adding additional ingredients. In this recipe – Easy Milk 'n' Honey Soap – the other main ingredients are honey and milk. This popular combination will be a hit with customers.

Milk and Honey Soap

A delightful soap that is a rich honey color, and smells incredible. This is a great one for beginners!

Ingredients

12 oz melt and pour soap base
5 oz. Distilled water
1/4 cup instant powdered milk
1/4 cup pure honey
fragrance oil, optional

Instructions

To melt the soap, either grate it or chop into small pieces. Add this, and the distilled water to the top of a double boiler. Keep the water below simmering, and gently melt the soap base. Add the powdered milk and honey, and stir well to combine. (At this point, you can add a few drops of fragrance oil, if you so choose. Either honey or vanilla fragrance oils would be nice additions.)

Spoon soap into molds, and lightly tap the mold against a hard surface to get rid of any bubbles. Allow the soaps to dry and harden thoroughly for a week before packaging.

Soap from Scratch

This is the *real* way to make soap, from scratch. If you're willing to invest a little more time and energy into the process, you can learn a fascinating craft along the way. You may choose to create a wide range of soaps and add all of them to your current product inventory. This soap uses both honey and beeswax. It has a great scent and color when completed. You don't need to add any additional fragrance to this soap, but you can if you choose to.

Continued on Next Page

SOAPS ... Cont. From Page 47

You may want to try a few sample batches first, to get the hang of this soapmaking technique.

Old-Fashioned Pure Honey Soap

12 oz vegetable shortening
4 oz coconut oil
1 oz beeswax
1 cup boiling distilled water
2 oz lye
1/8 cup (1 fluid ounce) honey

Combine the lye and water, and let cool. Melt vegetable shortening, and put aside. Over a double boiler, melt beeswax and coconut oil together and keep warm.

When the vegetable shortening has reached 120 degrees and the lye mixture is 100 degrees, then pour the lye mixture into shortening and stir until tracing occurs. (Tracing is a term used to describe the thickness of soap when it is ready to be poured out into molds. Check for tracing by running a spoon through the top of the soap. If it leaves a 'trace' of a line, you're ready to pour.)

Pour wax and oil mixture into soap mixture, and stir constantly. This mixture will get very thick once you've added the beeswax mixture. When completely blended, stir in the honey and pour out into molds.

Unmold the soap after two days. Allow your new honey soap to age for at least three weeks before packaging and selling.

SUPPLIERS

Online suppliers of soap base, soap molds, and other ingredients necessary are listed here. Also try online searches for "soapmaking supplies" to find more suppliers. Or, try looking in the Yellow Pages under Soap or Hobby and Craft, to find suppliers in your local area.

www.hollyhobby.com/ Holly Hobby Soapmaking Supplies is an amazing resource that has melt and pour soap base, soap colorants, soap molds, soap cutters, and just about anything else you'll need to create your first batch!

www.snowdriftfarm.com/ Snow Drift Farm has a wide range of soapmaking supplies, and also a terrific assortment of packaging options to choose from.

www.soapmaking.com/ Ye Olde Soap Shop at Summers Past Farm is not only a beautiful site to look at, it's also filled with helpful information and supplies for making soap. Another terrific resource to bookmark while on the 'Net.

PACKAGING

Of course, it doesn't matter how terrific your new honey soaps are, if the packaging is so poor that the consumer doesn't even notice them. Take the time to create a nice outside package and the customer will be completely pleased with their new purchase.

One of the largest online sources of paper, boxes, and other essential packaging supplies can be found at www.papermart.com. They have every type of packaging that you could ever possibly need, and some inspirational ideas.

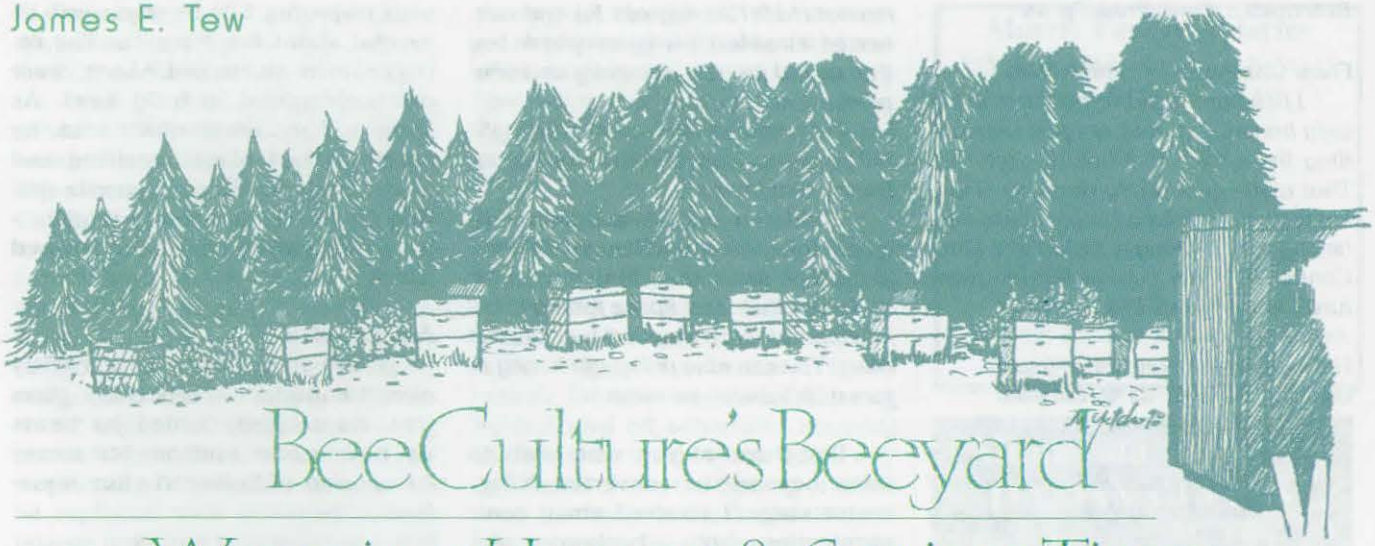
A simple, but elegant way to package your soaps is by wrapping with tissue paper, and then sealing with a label or seal.

Small boxes that are perfect for containing soap might be a good option. Then, all you need to do is pop a label on the box and price it – ready to sell! Be sure to always include your contact information on any package – your company's name, telephone number, address or e-mail address, so that they can contact you about purchasing more!

CONCLUSION

Soapmaking is a fun hobby for anyone – but for beekeepers it's just one more way that you can use honey and beeswax in a new and profitable way. Try adding one or two types of soap the next time you're selling your products and be prepared for some positive responses from your customers! Most people who love to eat honey will also love it in soap form. BC

James E. Tew



Bee Culture's Beeyard

Warming Honey & Spring Time

What Next?

I must admit that I never quite know what will trip your switch. In a recent article, I made the passing comment – from my Tennessee brother that he was having trouble liquefying some of his honey. He asked what others were using to get the job done. So in the past article, I asked what you were doing. Your switch tripped. My, my, did you ever take time to write and phone with techniques, designs and comments. Interestingly, most of you use some kind of recycled refrigerator or freezer with a common incandescent light bulb as a heat source. Honestly, I don't have such a unit and honestly, I have no experience with one. For those of us who don't yet have a converted refrigerator in our bee operation, I thought a review of the comments and procedures of those of you who do would be of interest. Here is a sampling of what you told me.

From J.D.L.

I have a perfect honey melter. I use an old defunct freezer. Take whatever shelves out you need to make room for your container. Now all you need is an extension cord and a light bulb. About 24 hours is all it takes to melt the honey in your bucket, depending on the size of the light bulb you are using. I hope this helps.

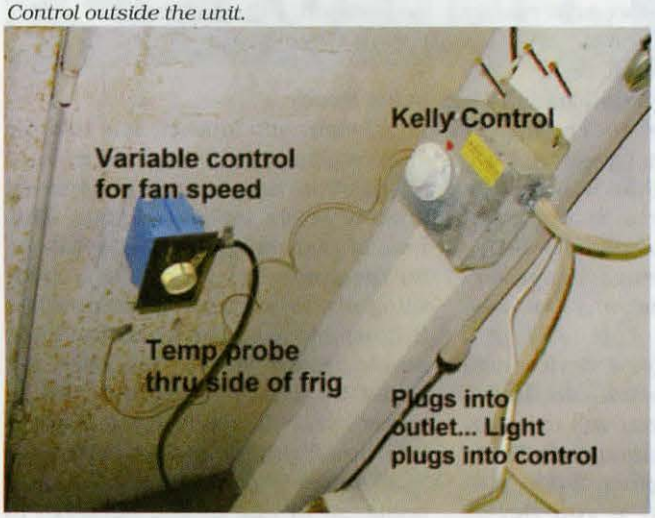
From Gregg S. in Colorado

The best method I know of, and use myself, to not only re-liquefy honey but to warm it to facilitate bottling is this: Find an old refrigerator (mine is a Philco circa 1950). Place honey in a five gallon bucket on the middle shelf and underneath place a fixture holding a light bulb. Simply raising or lowering the wattage of the bulb regulates the amount of heat. Place a sheet of aluminum foil on a second shelf underneath the honey (and above the bulb) so the heat is not concentrated on the bucket bottom. The total cost of my setup was the cost of the light bulbs, as I found the old fridge at a used appliance store for the cost of hauling it away.

From John D.

All one has to do is get an old used refrigerator and clean it up. Then wire the refrigerator through a used furnace control to two-100 watt light bulbs mounted in the frig. Set unit control to shut off at 130° F and on at 120° F - or what does best for you. I put honey in about 5:00 PM and it is ready to bottle the next morning after breakfast. I cannot remember when I did it the old way. Happy New Year.

Control outside the unit.



An inside view of Charlie V's hot box.

Continued on Next Page

BEEYARD ... Cont. From Pg. 49

From Charlie V. in Pennsylvania

I fixed up an old refrigerator to liquefy honey. I started out just dismantling the switch to leave the light on. That alone gets pretty darn hot. Talking to another fella a couple years ago, he suggested using a Kelly Heat Limit Control to better control the temperature. Wow! Works like a champ.

Here's basically what I've used:
Old refrigerator (even has real bad seals)
Light fixture mounted to side (keep the bulb away from plastic)
Kelly Heat Limit Control.....Cat. No. 250
Small fan (something that will handle heat is best)(will work without fan also)
Light bulb.....100-150 watt And a thermometer to monitor temp.
Some handyman skills

The Kelly control is extremely accurate. My daughter even hatched chicken eggs in this thing. The hotter bulb means less 'On' time and gets the temp up quicker from opening the door. I use a 250-watt bulb with the fan to push the air quickly. Otherwise the bulb might melt things. This will safely liquefy honey in buckets, plastic or glass jars that are labeled and sealed.

Charlie V. even included some photos shot with his "handy digital camera."

Bill S. in Virginia

I have a system that works quite well for me. At an auction, I purchased a surplus stainless steel milk box. For $4.00, I didn't care about the lack of a functional cooling unit because I wanted to add heat and figured its insulation qualities would work just fine. And, stainless steel is easy to clean. It appeared to be the kind used in school cafeterias. One half of the front side folded down and one half of the top folded back. This feature makes it very convenient for placing five gallon buckets in it. It is large enough to hold six stacks of two five-gallon plastic buckets for a total of twelve buckets plus a little extra room.

Ingenuity is required for providing heat at this point. I'm sure there are many ways to add thermostatically controlled heat and to circulate hot air. However, I used a combination of surplus and purchased items and designed a heating system as follows:

I purchased a clothes dryer thermostat (110-120 degrees F.) and connected it inside a 4-way receptacle box that would provide electricity and temperature control.

I assembled two porcelain light bulb receptacles with plugs for two infrared heat lamps.

I added a small 6-inch fan to circulate the air. I can re-liquefy only ten five-gallon buckets of honey at once, as I need the other space for my heating apparatus. This system is clean and easy. You can also re-liquefy honey in jars with labels—no mess.

For those of you who wish to move beyond the converted refrigerator stage, I received email communications from a beekeeper who works with a company that manufacturers commercial ovens – of all types and sizes. I have no experience with the products offered, but Steve, a company representative, wrote that several commercial beekeepers had purchased ovens from them to liquefy honey. Their company name is LEWCO, Inc., Sandusky, OH and their web address is: www.lewcoinc.com.

Rick B. in Collegeville, Pennsylvania wrote with an unusual procedure

I have a most simple method, I use two heating pads held in place around the pails with bungee cords. It works fine but takes around two days for the whole bucket to liquefy. This is fine for small production but not fast enough for a large number of pails if one is in a hurry.

Silly me.

Well, I must admit that I feel a bit inadequate. I commonly use refrigerators to keep things cold – not hot. Here in my lab, we use readily available devices to re-liquefy our honey. We have a small bench oven to handle jars and small pails. We use band heaters to re-liquefy drums. For 5-gallon pails, we have a hot water bath that will handle six 5-gallon buckets at one run. While all work well enough, all require time and patience to operate. I can't really say that any one system is perfect.

All honey-liquefying devices will require your calibration. No doubt, in the early stages you will overheat some honey and damage it. There is no obvious recommendation. Experiment. However, if you devise your own unit, I do hope you will be careful about fire hazards. The refrigerators discussed above were never designed to hold heat. As some of the contributors said, be careful about plastic melting and other combustible components getting too hot. I want to say it again – be careful with these improvised units.

Another plea.

Don't heat honey in a tightly closed container – especially glass jars. As a tightly lidded jar heats up, it can cause a minor but messy explosion of honey in your liquefier.

I like Recycling.

While I like recycling, make no mistake. Bee supply companies are well aware of the need for beekeepers to melt crystallized honey. They sell a wide range of models, thermometers, temperature controls, bands, belts, and tanks. If the converted refrigerator does not fit your need, no doubt a commercial device will. Refer to the beekeeping catalogs for current offerings.

It's Still Winter in my beeyard.

It's still winter for me in the bee yard while for you, as you read this, it is essentially springtime. I did a pretty good job of staying busy during the cold months. I checked the hive entrances to remove any accumulation of dead bees. I didn't find a lot, but I needed to feel busy. Most colonies are okay, but there are always the light ones over which I fret. We had a successful winter selling honey and we cleaned our lab and barn after our mess-making events last season. All in all, so far, winter has just been typical.

In the South.

Dwight, my brother, has told me that winters in Tennessee, and much of the South, have heightened anxiety levels for beekeepers. This time of year, an inch of snow can be on the ground or he can be scheduling air conditioner maintenance. So far, most of the colonies have ample honey stores; however, he plans to give a two-gallon pail of sugar syrup in February to stimulate brood production and increase food stores. Skunks and field mice continue to nag at the beehives in

the winter months. (I know some Alabama beekeepers who started feeding in mid-January.)

During a routine inspection last winter (2001), two of the hives had "settled" resulting in the front of the hives being higher than the rear. Condensation and hive litter from inside the hive blocked the entrance completely. At least a half pint of water poured from the entrance as each hive level was corrected. In Winter 2002, entrance reducers were not used, however water continued to collect on the inner cover. Within the next few weeks, all of the bottom boards will be replaced with screened bottom boards (painting is in progress). Will the moisture accumulation disappear in Winter 2003? Dwight suspects so. A few dedicated honey plants started offering pollen in mid-January and included henbit and red maple. Supers will soon be out of storage and "aired" prior to placing on the hives. Medications are in place and will be removed very soon in anticipation of the honey flow, which should begin in early April. All things considered, the bees are okay and Spring is at hand.

All I can do is wait.

All I can do is wait for Spring. You are much closer than I. I should be painting and fixing, but I am successful at finding reasons to do it later. When later comes, I will search for new excuses for being behind and off-schedule. Blaming the weather is always a good way out. Regardless, the Spring of 2002 is on the horizon. No doubt this will be the year when I set records for honey production. BC

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Apimondia in Africa - 2001

Malcolm T Sanford

Consideration of the *Varroa* situation in South Africa as well as the rest of the world falls under Apimondia's Bee Pathology Standing Commission. Treatment of *Varroa* was the largest symposium in Durban as might be expected and took two full sessions. *Varroa* has long been present in Africa. This author saw it on European honey bees (*Apis mellifera carnica*) in Egypt in the early 1990s. By all accounts most of Africa north of the Sahara has been affected since the 1980s, but it was not reported in the south. P. Kryger first found the parasite in the Cape region of South Africa in August, 1997 Since then, it has spread to the border of Kruger National Park, occupied by *scutellata* bees. S. J. Martin & P. Kryger discussed the impact of *Varroa destructor* so far in South Africa. Originally several factors were thought to be important in limiting its spread. One is that *capensis* has the shortest post-capping time of any honey bee ecotype. This is considered one possible reason that Africanized honey bees in the Americas are more *Varroa*-mite tolerant. The shorter this development period, the fewer female mites that are produced, which is why *Varroa* is hardly ever found in queens (15.5 days) and prefers drones with the longest post-capping time (about 24 days). This fact and also that *scutellata* bees in the Americas are reported to be more tolerant in general were seen as hopeful signs that *Varroa* would not be as problematic in South Africa as reported from other parts of the world. Experiments reported at Apimondia, however, have shown that neither of these factors appear to affect mite reproduction. The fact that some colonies have not collapsed with very high mite levels (tens of thousands of mites) provides some residual optimism, but researchers believe there will be large losses once the *Varroa* population becomes entrenched and begins to spread viruses already present in the country.

Dennis Anderson

Where the *Varroa* mite has been reported in other parts of the world, there have been catastrophic losses of feral honey bee colonies. In Europe and the United States beekeepers do not rely on the wild population for the health of their industry. Instead, package bees and queens are produced to replace *Varroa* losses. In Southern Africa, however, the beekeeping industry uses the wild or feral population extensively. Many South African beekeepers managing Langstroth hives do no nest management at all, simply letting natural swarms populate colonies that are lost either to swarming, absconding or activities of pests and predators. And in the central part of Africa, there is no beekeeping per se. Rather, the human population relies on rustic hives (logs, clay pots) again based strictly on feral honey bees. Loss of the wild population due to *Varroa*, therefore, could be cataclysmic for both the first- and third-world beekeeping practiced in central and south Africa.

Taking the above under consideration, M. Alsopp of South Africa's Plant Protection Research Institute discussed some of the practical aspects of a *Varroa* management plan in the country. Left to their own devices African honey bees may be able to accommodate the mite as they appear to have done with other honey bee diseases he said. It would be expected that large numbers of African colonies would collapse and die as a result of *Varroa*, both in the wild and managed bee populations, but thereafter, resistance to the mite is expected to develop rapidly in these populations. Only *Varroa*-resistant bees would produce swarms and drones allowing natural selection to take its course toward tolerance. The economic demand for commercial honey bee colonies will, however, dictate that beekeepers treat colonies with Varroacides should honey bee losses become considerable. This appears to be already happening.

Treatment will artificially sustain the susceptible honey bee population, according to Mr. Alsopp, and will prevent the development and spread of a naturally-selected *Varroa* resistant population. Hence, a comprehensive response to the *Varroa* threat is required, involving Integrated Pest Management (IPM) strategies, further research, and regional, governmental and legal strategic actions.

Included in this strategy would be:

1. The development of mechanisms or legislation for the regional control and rotation of Varroacides with different modes of action, to guard against the development of resistance in the mite population and to preserve adequate chemical control.
2. The development of guidelines for the use of non-regulated chemical products presently being used against the *Varroa* mite.
3. Mechanisms to ensure the responsible use of chemical measures.
4. The development of cultural (non-chemical) control measures against *Varroa*, to supplement chemical control.
5. The active development of natural resistance to

the *Varroa* mite by wild honey bees by restricting the use of chemical control in certain regions, facilitating the development of tolerance by natural selection.

It will be instructive for the rest of the world to closely follow the *Varroa* situation in south and central Africa. This situation not only has great importance for beekeeping however. The honey bee is a native insect in Africa and therefore its survival and health is important for many wild plant communities that rely on it for pollination and propagation.

Varroa Types Continue to Proliferate

It was first reported at the last Apimondia meeting in Vancouver, Canada, by Dr. Denis Anderson of Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO) that there are many more kinds of *Varroa* than first meet the eye. Three distinct species were initially identified, *V. underwoodi*, *V. rindereri* and *V. Jacobsoni*. The latter was considered the most virulent and responsible for the worldwide *Varroa* phenomenon causing widespread destruction of colonies of European honey bees until Dr. Anderson determined that it was not the culprit at all through analysis of DNA. Instead, another species, he named *V. destructor*, was the cause. If that wasn't complicated enough, Dr. Anderson reported he had isolated 18 genotypes in the species complex.

At the South African Apimondia meeting, Dr. Anderson reported that over twenty genotypes of newly-named *Varroa destructor* and newly-defined *Varroa jacobsoni* now exist. A critical piece of information to come from this work is that particular strains of *Apis cerana* carry their own kind of *Varroa* mite. It was from the Asian honey bee (*Apis cerana*) that the mites on the European honey bee (*Apis mellifera*) were thought to have originated. Java and Malaysian strains of *A. cerana*, for example, carry Java and Malaysian genotypes of *V. jacobsoni* respectively, while Korean and Vietnam strains of *A. cerana* carry Korean and Vietnam genotypes of *V. destructor* respectively. Only two genotypes of *V. destructor* are responsible for the worldwide destruction of so many European honey bee colonies. These are the so-called Korean and Japan/Thailand genotypes of *V. destructor*.

According to Dr. Anderson, the Korean genotype has the widest geographical distribution, affecting *A. mellifera* in the Europe, the UK, Russia, the Mediterranean, the Middle East, North Africa, Asia, North and South America, Canada and New Zealand (and now identified in South Africa). The Japan/Thailand genotype of *V. destructor* has a more restricted distribution. It affects *A. mellifera* in Japan, Thailand, North and South America and Canada. In the Americas, this mite was initially found only in Brazil, but has since spread to other parts of South and North America and Canada. While the detection of this mite in Brazil seemed incongruous at first, it correlates with reports that *Varroa* first appeared in Brazil following the introduction of European honey bees from Japan in the 1970s.

The ability of any genotype to effectively reproduce is one possible key to its control, according to Dr. Anderson. There are many possibilities. Some genotypes on *A. cerana* only reproduce in drone brood, however, they may or may not reproduce on *A. mellifera* drone brood. Most likely, oogenesis (egg-laying ability) in all these mites is activated by Juvenile Hormone III (JH III). Recent studies in Java have indicated that the component that *Varroa* mites need to activate JH III is a host (bee) component and is obtained within a 72-hour period after the mites enter bee brood cells. This component is likely to be the same or very similar in all *Varroa* mites, as it has to eventually activate JH III. It may differ in different bees by being present in specific concentrations, or released in slightly modified time frames. Finding this component may enable the development of lines of *A. mellifera* that are totally resistant to the Korea and Japan/Thailand genotypes of *V. destructor*.

The above analysis may help explain some of the tolerance that *A. mellifera* is now showing to *V. destructor* in different parts of the world, according to Dr. Anderson. Indeed, breeding programs currently underway, such as those developing SMR honey bees or attempting to use tolerant bees identified from other parts of he world, may actually be exploiting this mechanism, he concluded.

Varroa and Viruses

The existence of large *Varroa* parasite populations in colonies of honey bees that appear to be healthy prompts the question of how specifically the mites are affecting their hosts. There is a parasite component, but it also important to understand that a viral one exists as well. N. L. Carreck and associates of the Plant & Invertebrate Ecology Division, IACR-Rothamsted, Harpenden, Hertfordshire reported on the correlation of *Varroa* infestation with various viruses in the United Kingdom. Investigations in Devon and Hertfordshire from 1992 to 1996 determined that the death of severely infested colonies was associated with slow paralysis virus (SPV); an infection which had never previously been found to be responsible for mortality in nature. The authors say the occurrence of SPV in dead adult bees and brood seems to be parallel to that of acute paralysis virus or APV in infested colonies on the European mainland, although APV too has rarely been found as a cause of mortality in infested colonies in Britain. Both viruses normally persist as latent infections in bees, are infective by injection into the haemolymph, are rapidly fatal, and are transmitted to both brood and adult bees by the mite. The authors found two other viruses in *Varroa*-infested colonies, cloudy wing virus (CWV) and deformed wing virus (DWV). A number of additional viruses, filamentous virus (FV), black queen-cell virus (BQCV), bee virus Y (BVY) and bee virus X (BVX), were also detected in dead adult bees from *Varroa*-infested colonies, but were not considered vectored by mites.

The authors say that DWV has now become the most widespread infection in association with *V. destructor* in honey bee colonies in Britain. It was known previously only as an infection of adult bees, but the mite has been found to be responsible for introducing the virus into a life stage of the bee that it would not normally infect. Unlike APV and SPV, DWV is not rapidly fatal. Bees infected at the pupal stage continue to develop and emerge, although all contain large amounts of virus and their longevity is significantly reduced. Large

Continued on Next Page

APIMONDIA ... Cont. From Pg. 53

amounts of virus also accumulate in bees infected after emergence but their lives are not similarly shortened. These provide a persistent reservoir of infection for mites to acquire and transmit, which explains the eventual predominance of this infection.

The presence of viruses linked to mite parasitism puts a more complex face on the *Varroa* control situation. Many integrated pest management (IPM) techniques seek to reduce the mite population, however, these would appear to be less effective if viruses rather than mite numbers were found to be the major contributors to honey bee colony loss associated with *Varroa*.

Unfortunately, viruses are not well understood and research effort on them is minimal. Thus, there continues to be a large research effort around the world that seeks to reduce mite populations in bee colonies in the hope that losses will as a result also be minimized. The South African Apimondia symposia featured studies using chemicals such coumaphos, oxalic acid and thymol to control *Varroa*. In addition, other techniques were described, including powdered sugar, drone traps, queen confinement, and Dr. Zachary Wang's Mitezapper <http://www.mitezapper.com>. The latter has been described in previous articles in this magazine.

Integrated Pest Management (IPM) and *Varroa*

Perhaps most intriguing was K. Fakhimzadeh's study using powdered sugar as a control measure. Evidence in the United States shows that powdered sugar is a reasonable way to show relative mite infestation levels. This technique developed at the University of Nebraska, however, has not been considered effective as a control in the nest, especially when brood was present, since mites ensconced in brood cells were not vulnerable <http://entomology.unl.edu/beekpg/tidings/btid2000/btdjan00.htm#Article2>. Dr. Fakhimzadeh's study showed a mite knock down with powdered sugar of 91% with direct dusting and 62% with air- assisted dusting. Sugar dusting efficiency in knocking down the *Varroa* in some cases was similar to that reported for mite kill in studies using chemical applications. The study also compared the technique to using carbon dioxide (CO_2) in conjunction with powdered sugar. It was shown that CO_2 in combination with sugar or alone did not increase the mite fall so the author recommended not using it as part the control of *V. destructor*.

Mr. Fakhimzadeh's results reconfim that powdered sugar treatment as described does not have any obvious side effect on the capped brood nor the growth of the bee population. In addition, no queen loss occurred even if the treatment was applied as frequently as every three days for a period of one month. It was concluded that sugar dusting alone is a useful tool, which could be included in integrated mite management programs. Though not reported in his paper Mr. Fakhimzadeh said in his presentation that particle size is important, and small particles of five microns was optimal. Most icing sugar is a mixture of particle sizes, thus, its present configuration (as found in most stores) is variable and this would presumably affect mite control efficiency. Again, since mites sealed in brood cells are affected, several applications would be necessary to ensure good control.

Dr. Joerg Schmidt-Bailey, University of Illinois, Urbana Champaigne, IL <http://www.urbanext.uiuc.edu/staff/schmidt.html> discussed a series of Integrated Pest Management (IPM) techniques based on trapping mites in drone brood. As he put it, "from humble beginnings to patented devices." Originally, worker brood was used to trap mites; later that of drones (taking advantage of the fact that a longer post-capping time produces more mites) was substituted. Finally, the use of the Mitezapper was described as another advancement. Dr. Schmidt-Bailey concluded that he expects to see more developments in this arena in the future. Conspicuous by its absence was an IPM technique that has been getting recent attention in the U.S, the use of the open-meshed floor.

G. A. Piccirillo & D. De Jong reprsenting the Departamento.de Biologia, Fac. Filosofia Ciências e Letras de Ribeirão Preto USP, SP Brazil studied the *Varroa* infestation rate in different types of worker cells in eight africanized honey bee colonies. New brood combs (NC) built naturally by the africanized honey bees and old brood combs (OC) with relatively smaller cells were placed in the same colony and with egg laying by the same queen. The results showed that OC cells attracted more *Varroa* in relation to NC cells, even though the cells had a smaller diameter. They concluded that though cell size may be important, characteristics inherent to the larvae, to the comb or the food in the OC workers cells might have an important influence in attracting *Varroa*. This study provides some more evidence that periodic renovation of brood combs, also considered to be important in reducing microorganism numbers (those causing foulbrood and chalkbrood as examples) in a colony could also reduce *Varroa* populations in the bargain.

Irish Beekeepers celebrate being chosen for Apimondia 2005.

Varroa Research in Argentina and Brazil

The largest contingent of displays at Apimondia's apiculture exposition in South Africa was from Argentina. I was told over 40 persons registered from

that country. One reason was the extensive lobbying the group did to become the site for the 2005 event. Unfortunately, their bid was not accepted, going to Ireland instead. Nevertheless, it is abundantly clear that Argentina is emerging as one the premier world apicultural powerhouses, the recent collapse of the Argentinian economy notwithstanding.

It has been clear for some time that tropical Brazil appears to weathering the *Varroa* mite storm with little if any chemical treatment by beekeepers on Africanized honey bees. In contrast, there is much interest in controlling the mites in Argentina where many European honey bees exist using a variety of possible solutions. Several presentations at the South African Apimondia meeting revealed that these two countries are collaborating in this research. Examples included comparing queens with identical genotypes in both temperate and tropical parts of Argentina. One paper concluded that climate does play an important role in mite reproduction; most mite reproduction was found in temperate areas. A comparision between non-hygienic (NH) and hygienic (H) stocks revealed that differences in uncapping and removal between hygienic and non-hygienic colonies were significant. One hour after killing of the worker brood by pins in the H colonies about 45% of the brood was completely uncapped but only 4% in NH colonies. However, 100% of the brood was totally uncapped and 43% removed by H colonies after only four hours; it took the NH component 24 hours. Thus, it is possible to discriminate between H and NH colonies in only one hour using observation hives. Hygienic behavior consisting of both uncapping and removing dead brood (HR) as well as brood infested by *Varroa* (RR) was also investigated. Differences were observed in commercial colonies deemed susceptible to mites and feral colonies that were tolerant. However, the authors concluded that the results do not fully explain mite tolerance by some colonies in South America.

Brazilian beekeepers have for a time now been making assertions that because no treatment for either *Varroa* or brood diseases was necessary, the honey coming from their country should qualify as "organic." Argentina also appears to be climbing on this band wagon in a somewhat different way. Investigators, thus, are looking at a specific formulation of formic acid in a gel matrix (Beevar). They conclude the product is a good alternative for *Varroa* control because it is organic, effective, easy to use and does not affect queens, workers or brood in treated colonies. A formulation of 4.5 percent oxalic acid (Oxvar) is also under investigation. Both products are considered effective against mites, however, the latter one is more compromised when brood is present. Another innovative project involves incorporating organic products into foundation in the hope of producing a comb that is in effect its own treatment device. Seven treatments were used including several concentrations of formic acid, oxalic acid and thymol. In general, comb with these products incorporated had fewer mites per cell than normal (control) foundation.

Other Argentine research reported on laboratory studies using essential oils to control *Varroa.* According to the authors, about 150 different essential oils have now been tested as an alternative to synthetic acaricides. These are especially prepared in emulsion and applied using a "Burgeon tower." *Varroa* killing ability is determined at 3, 4 and 5 percent concentrations. The oils of two specific plants, *Heterotheca latifolia* and *Tagetes minuta* reported here showed 63 and 56 percent lethality at 5 percent concentration respecively. Although the results are encouraging, the authors say that translating laboratory results into effective field trials will still require a good deal of study and effort. BC

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

?Do You Know? Answers

1. **True** Wax scales are removed from the wax pockets by the bees producing them and passed forward by the tarsi to the mandibles. This is accomplished typically by pressing the first tarsal segment of the hind leg against the scale and pushing toward the rear. Spines penetrate the scale attaching it to the tarsus and then the leg passes it forward so that it may be grasped by the forelegs or mandibles. The pollen combs on the basitarsi may also help remove the scales, but usually only the large spines of the distal segment are involved.
2. **True** Propolis collected by honey bees comes in different colors. Propolis colors vary from cherry to dark red, opaque, brownish, yellowish or blackish. Propolis is a mixture of many compounds and is a resinous gum-like material. The composition is complicated and varies according to source. Common sources of propolis are said to be buds, twigs or leaves of alder, horse chestnut, poplar, birch, elm, ash, blackberry and the conifers.
3. **True** Beeswax is a stable material; samples thousands of years old have been found to have deteriorated very little, being nearly identical with that produced today.
4. **True** Normal beeswax is a solid material that is plastic when warmed to about 90° and is brittle at low temperatures.
5. **True** Wax comb acts like a sponge, accumulating toxic levels of air pollutant particles like lead, mercury and pesticides. Fat soluble acaricides are readily absorbed by beeswax and are being stored for many years. A decrease or degradation does not occur, as far as we know. Tests have shown that in all countries where acaricides are being used, uncontaminated beeswax can hardly be found.
6. **True** No microorganisms routinely attack and/or degrade beeswax in normal storage. Only certain soil microbes are able to degrade waxes, thus wax refuse and scrapings on the ground in an apiary soon disappear. Beeswax is a stable material; samples thousands of years old have been found to have deteriorated very little.
7. **True** It is well known that the longer a comb is used for the rearing of brood, the darker and heavier it becomes. Each inhabitant of a cell leaves two lasting traces behind, the larval feces and the cocoon spun by the larva before pupation. With use the wax absorbs pigments from propolis, pollen, and pupae.
8. **True** Fat-soluble pesticides are readily absorbed and stored in beeswax within the hives. When this wax is rendered and made into foundation, the pesticide residues remain concentrated within the wax. Presently, many varroacides can be found in wax foundations on the market. Purchase of foundation containing a varroacide residue could ultimately result in this residue in honey, even though the beekeeper may not have used this particular varroacide.
9. **True** Batiking is a method of making colored designs on fabric. Portions of the cloth are covered with beeswax and these waxed areas resist dyeing. When the dyeing process is complete, the wax is removed with heat, usually boiling water.
10. **True** Beeswax is secreted as a liquid, and rapidly hardens into wax scales upon contact with the wax plates and air.
11. B) mellitin
12. C) 10-hydroxydecanoic acid
13. E) 145° F
14. Use of unlabeled, unapproved acaricides
    Use of acaricides during the honey flow
    Using a wrong dosage of an acaricide
    Colonies treated prophylactically when it is not necessary
    Contaminated winter food stores may penetrate the spring honey
    Contaminated wax particles encorporated during the uncapping/extraction process
    Penetration of residues from wax combs
15. Bright Light, Queenlessness
16. Saliva, Propolis
17. Slumgum is the refuse from melted combs after all or part of the wax is removed.
18. The largest commercial use of honey bee venom is currently the desensitizing of individuals who are allergic to bee stings.
19. Dipping, pouring, molded, rolling, extruded

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

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

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

GLEANINGS

MARCH, 2002 • ALL THE NEWS THAT FITS

FROM OTHER SOURCES

Bakersfield Californian, 1/17/02

ILLEGAL CHINESE IMPORTS PINCH GARLIC GROWERS

Americans love garlic, but growers here say illegal Chinese imports, unpredictable, weather and soaring land costs are threatening to squeeze the domestic garlic industry right out of its stinky business.

The Fresh Garlic producers Association complained in December to the U.S. Customs Service that Chinese garlic – which is supposed to pay a 376% tariff before it enters the country – is slipping its way through ports in New York, Miami, Long Beach and Puerto Rico in shipping containers from Thailand and Vietnam.

The garlic in those containers said association spokesman Jim Provost, is being sold – without tariffs – for about 30% below domestic prices.

"We're facing a looming threat from these illegal imports," Provost said.

Customs Service officials confirmed they're looking into the complaints, the latest development in what has been a decade-long challenge to restrict illegal Chinese garlic imports.

"As long as there is a demand for garlic in the U.S. and a supply in China, they're going to try to get it in," said Kevin McCann, an international trade specialist with Customs Service in Washington, DC. "But they're certainly not going to pay the 376% tariff, so they'll try other things."

McCann said investigators have been working in recent weeks in Long Beach, the primary port for garlic imports, and that some type of intervention action will be taking place in the near future.

Chinese trade ministry officials in Beijing said they had prepared answers to questions raised by the Associated Press about garlic, but had not received approval to release those responses.

At Christopher Ranch, the nation's leading fresh garlic producer about 100 miles south of San Francisco in Gilroy, spokeswoman Patsy Ross said trade transgressions are not their only problem.

"This is a fragile industry," she said, standing in a bustling garlic-packing warehouse thick with fumes. "There are a lot of things that are out of our control."

El Niño's 1997 torrential rains, for example, left floods in the fields and a rusty fungus on the garlic, wiping out about a third of the 1998 harvest. And increasing property values – particularly in California where 84 percent of U.S. garlic is grown - have pushed farmers off their fields and out of the industry.

But the largest threat of all has come from China, the largest garlic producer in the world with 13 billion pounds a year, accounting for 66 percent of the world output.

U.S. garlic growers fought for and won relief from cheap Chinese imports in 1994, when the International Trade Commission issued an anti-dumping order and imposed the highest tariff in existence on any agricultural product – 376%.

Those limits initially slowed the flood of Chinese garlic that had gone from about 3 million pounds a year in 1992 to 64 million pounds – almost half the entire U.S. market at the time – by 1994.

But since 1994, there have been regular attempts to dodge the tariff, according to researchers at the National Food and Agriculture Policy Project in mesa, AZ.

For example, in April 1997, some traders said their Chinese garlic imports originated from Vietnam, Taiwan or Thailand to avoid paying duties. Laboratory tests of minerals in the garlic were able to show the true source.

Continued on Next Page

Cornell To Combat Deadly Threats

USDA HONEY BEE GENETICS & IPM CENTER

Cornell University will be the home for a new Honeybee Genetics and Integrated pest Management Center that will study the continuing threat from deadly parasitic mites and Africanized honey bees. The center is funded by a $1.8 million grant from the U.S. Department of Agriculture" (USDA) Initiative for Future Agriculture and Food Systems.

The grant will establish the largest university-based, honey bee research and extension infrastructure in the country.

The new center will focus on developing solutions to the two major threats to honey bees, insects that are responsible for agricultural pollination valued in the billions of dollars. The director is Nicholas W. Calderone, Cornell assistant professor of entomology, assisted by project scientists Walter S. Sheppard of Washington State University in Pullman and Jeff Pettis of the USDA-Agricultural Research Service, Bee Research laboratory, Beltsville, MD. Other supporters of the program include the USDA Sustainable Research and Agricultural Education program, the USDA Northeast Integrated Pest Management program, the New York State Department of Agriculture and Markets, and the Organic Farming and Research Foundation.

Most of the pollination for more than 90 commercial crops grown throughout the United States is provided by *Apis mellifera,* the honey bee. The value from the pollination to agricultural output in the country is estimated at $14.6 billion annually. Growers rent about 1.5 million colonies each year to pollinate crops.

The introduction of the parasitic bee mite *Varroa destructor* in 1987 and the invasion of the Africanized honey bee in 1990 have threatened honey bee colonies. "Parasitic mites are currently managed with pesticides, but as with other agricultural pests, the mite population has developed resistance to these pesticides and beekeepers will soon be without effective treatments," says Calderone.

He notes that the extremely defensive Africanized honey bee could be even more devastating. This honey bee is well established in the southwestern United States and is spreading northward into the Central Valley area of California and into the southeastern United States, says Calderone. These are the principal queen and package-bee producing areas that supply beekeepers with new stock to replace losses due to parasitic mites. "The establishment of the Africanized honey bee in these areas will result in restrictions on the shipment of bees from these areas. This, in turn, will severely limit the ability of beekeepers to restock their operations," he says.

Migratory pollination, which provides the majority of pollination services, might be particularly hard hit because migratory bee operators typically spend the Winter in the South and travel throughout the United States to pollinate crops during the Spring and Summer. The establishment of the Africanized honey bee in the southern states will result in restrictions on the movement of migratory operations throughout the country, Calderone says.

In its evaluation of methods for controlling parasitic mites, the new center will emphasize the development of mite-resistant stocks of honey bees. The breeding program will be the first to use honey bees to integrate traditional animal-breeding methods with modern molecular technologies.

Calderone says there will be an emphasis on identification and the use of molecular markers for mite resistance and other desirable traits. "Marker-facilitated selection offers the first real opportunity to transform beekeeping from an industry that has

Continued on Next Page

3 LABS NOT IN BUDGET

If you haven't heard, the 2003 budget submitted by the President in early February, calls for a $15 million base fund reduction for the USDA's Agriculture Research Service (ARS). An additional $90 million will be terminated as congressional add-ons, part of which will come from closing two Albany, CA research facilities and additional programs in wheat quality labs.

Of the $15 million, part of this is to be accomplished by terminating all operations at the Beltsville, Tucson and Baton Rouge Bee Labs. One scientist from each lab and that scientist's funding will then be transferred to the Weslaco Bee Lab in Weslcao, Texas. The remaining scientists and staff will be offered other positions in ARS. This will reduce the USDA Honey Bee research scientist positions from 21 to 9.

These transfers will increase Weslaco's budget by $1.3 million, even though they, too, will lose a congressional add-on from last year. The Logan, Utah, Bee Lab will lose a $249,000 congressional add-on, but undergo no other changes or transfers.

Dr. Phyllis Johnson, Beltsville Area Director said that the lab closing proposals were part of the findings of a Facilities Task force established by the last Farm bill committee.

The budget proposal next goes to, and needs to be approved by both the USDA and the OMB before it goes to congress. They have, to some degree, the latitude to decide what is, and isn't in the final budget presented to Congress.

Concerns of the affected industries should be directed to local congressional offices, members of the appropriations committees and the Secretary of the USDA said Dr. Johnson.

If enacted as proposed, the three affected Bee Labs will close and transfers occur at the end of the current fiscal year, September 30, 2002.

IPM... Cont. From Pg. 57

become dependent on a growing number of expensive pesticides and antibiotics into one that is free of chemical inputs and that is economically viable in today's competitive global marketplace," says Calderone.

Because the breeding populations will be maintained using closed-mating technology, they will be kept free of Africanized honey bee genes, thereby providing an unadulterated source for commercial queen and package producers.

The grant also provides funds to develop a regional extension program in apiculture and to coordinate extension activities with institutions in other regions. The Cornell University Master Beekeeper Program, which Calderone established in 1998, will serve as the centerpiece for the expanded extension program.

GARLIC ... Cont. From Pg. 57

In February 1997, two California importers of Chinese garlic pleaded guilty to avoiding more than $9 million in customs duties. In that case, importer Jimmy Tani of LaPuente, CA, was sentenced to 18 months in federal prison for circumventing U.S. trade laws.

Garlic industry attorney Mike Coursey (who also represents the U.S. Honey Producers in their antidumping efforts against China) said imports from Thailand suspiciously shot up last year, and that domestic garlic producers estimate between 10 million and 15 million pounds of Chinese garlic leaked into the United States illegally.

"There's been a ferocious increase coming in shipping containers supposedly filled with Thai garlic, and there's no way that the product coming in is actually Thai," he said. "It's beautiful Chinese garlic, quite different from what's grown in Thailand. There's just no doubt about it."

The United States isn't the only country to scuffle with China over garlic. Thailand, Canada, Mexico, Israel, and most of Europe have tariffs in place against Chinese garlic, which reaches those markets at just 15 cents a pound, about one-fourth of what it costs other countries to produce.

And just last year, garlic became a key issue in a Chinese trade dispute with South Korea. The two countries had been wrangling over the issue since June 2000, when South Korea imposed a 315 percent tariff on cheap Chinese garlic to protect its farmers.

Contaminated With Pesticides

EUROPEAN UNION SUSPENDS CHINESE ANIMAL PRODUCTS IMPORTS, HONEY

Brussels, 25 January 2002 The EU Standing Veterinary Committee (SVC) voted in favor of a Commission proposal to suspend the import into the EU of Chinese products of animal origin intended for human consumption or for use in animal feed. Products already on route will be allowed into the EU but will be subject to increased controls and testing by member States. The main products affected by the suspension in volume terms are honey, rabbit meat, poultry and crustaceans such as shrimps and prawns. A recent mission of the EU's Food and Veterinary Office (FVO) revealed serious deficiencies of the Chinese residue control system and problems related to the use of banned substances in the veterinary field. EU directives stipulate that necessary measures must be taken for imports ofproducts from third countries which are likely to constitute a serious danger to human or animal health. The Commission will re-examine the situation together with Member States before the end of February. The Commission intends to work urgently with the Chinese authorities with a view to putting in place the necessary measures to allow trade to resume.

FVO Inspection To China Inspectors from the EU's Food and Veterinary Office (FVO) visited China in november 2001 to evaluate the control of residues in live animals and animal products. Member States were informed about the findings and conclusions of the FVO visit at the SVC meeting in December. In the light of further discoveries of banned substances, the Commission now considers that a safeguard measure is warranted.

Chinese Exports To The EU Chinese products affected by the ban are rabbit meat, poultry meat, honey, molluscs, crustaceans, frozen shrimps and prawns, and pet food. In 2000 those imports were worth 327.7 million. The following products will not be affected by the ban: fishery products form open sea fishing (except crustaceans) and casings. the import of those products from China into the EU was worth 400.4 million in 2000.

The decision will be reviewed in the light of any further information offered by the competent Chinese authorities and on the basis of the results of any further FVO inspections necessary.

Chloramphenical In Shrimps There have been chloramphenical residues in samples from shrimps and prawns imported from China. The presence of chloramphenical in food presents a potential risk for human health. it is a potent, broad-spectrum antiobiotic drug, which is banned for use in food producing animals in the EU since 1994. it is used in human medicine only in serious situations.

Press Release Distributed by The National Honey Board

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I have often wondered just when it was I became a "Beekeeper" I know it wasn't in the first few years of my adventures into the world of bees. I know that in the first couple of years the bees grabbed my attention to the point where I was reading just about everything from "First Lessons in Beekeeping" to *The ABC and XYZ's of Bee Culture*, and a host of books in between.

Perhaps Walter Lane could better describe the moment I became a beekeeper. I am sure he must have been there. Walter was my mentor, my guide into beekeeping.

I have made my share of honey over the years and in some years a whole lot more honey than money. I didn't enter the beekeeping world with the thought that I could make money at it. I started with one hive (a mistake I will openly admit to) and the rest is history. I work at my trade now with a totally different outlook on what is done and when it gets done. I look for different things now than I did some 20 years ago. Disease wasn't important when I had just one or two hives but today with 100 it is very important. I owe a lot of what I do and when I do it to a lot of people that either knowingly or unknowingly passed valuable information on to me at the right moment for it to be absorbed into my mind's memory banks.

I still have a lot to learn and I think that is the one issue that has kept me going when I have tried to dismiss the bees as an unimportant part of my life. I keep coming back to the bees and in their world I find the ability to put the right things in perspective.

I recall the first real lesson I learned from the bees. I had about six hives back then and several of them were located at the head of my garden. I didn't put them there because I was smart but because there wasn't anywhere else to put them. One day I could tell we were going to get a shower or thunder shower at any moment but I had some weeding I really wanted to get done so I kept working right along. Weeding is one of the chores I really enjoy because along with the weeding come those moments when you are leaning on the hoe that the world's great mysteries are unveiled to you. (My way of justifying goofing off.) It was during one of those pondering moments I happened to look at the beehives. The only thing I noticed was that it seemed to me the bees were lazy, as there were almost none leaving the hive and only a few returning from the field. I still hold to this day that the last bee walked in the entrance of the hive just 10 seconds before the sky opened up. I didn't even bother trying to run to the house. I was soaked long before I even cleared the garden. Lesson learned.

I suppose I could, or should, pick a moment in my life where beekeeping began and let it go at that but you know there isn't one real moment. I have been teaching bee schools for some 12 years or more and teaching at EAS for eight. I think, maybe, it was the need to pass on what Walter, Tony, Kim, Dewey, Clarence, John and a whole host of others taught me over the years that made me a beekeeper. Maybe it was reading all the articles written by Richard Taylor, Keith Delaplane, Dick Bonney, George Ayers and all the other journal contributors. Maybe (and this is a real stretch) I was just meant to be a beekeeper. I know I have never regretted getting that first hive of bees and for that matter, the last one either.

I do know there is a difference in the people that *have* bees and those that *keep* bees. I see it every day in the shop and at the meetings I go to. Those faces that light up in the presence of other people that keep bees. The unending questions of better ways to do things. The constant efforts to tell others about how they do what they do to work with the bees. The sadness you see on their faces in the Spring when the Winter has been particularly hard on their bees. I often wonder what turned these people from *beehavers* to *beekeepers*. I bet their story isn't all that different from yours or mine.

Here's what I think makes a beekeeper and these aren't in any particular order.

• You must learn diseases. I have been taken to task for allowing my bees to rob out the honey supers after extracting. The students were told that this promotes the spread of American Foulbrood. If you don't know if you have this dreaded disease then you're a beehaver not a beekeeper.

• You must learn the life cycle of the honey bee. I have been called upon a number of times to look at hives that don't seem normal. Mostly it is a case of the hive requeening itself and there is a break in the brood cycle. Fortunately I have very rarely been called to find the hive diseased.

• Value all your hive products. The care of honey is the farthest thing from most beehavers minds. They are the ones that set their honey in the damp basement for several months and then extract and pass out as gifts this funny tasting honey. These are the same people that show up to buy foundation every Spring and tell me they just throw their cappings wax away.

• Never stop learning about the bees. Whether you subscribe to the journals or attend regular meetings where the good and bad news about beekeeping is passed on stay in touch with current events. The best may yet be coming.

I know a lot of people that have given up on bees since the arrival of mites. I am not saying we have a solution to this problem, and we may never have one, but things are not as bleak as they were in 1993. I love bees and beekeeping and have made a host of life-long friends that do exactly what I do. They may not do it in the same way or at the same time as I do but we are all "Beekeepers"

George Imerie once told me you will never make a drop of honey in the super you leave in the barn. George, it took me five years of thinking about that before your lesson sunk in but thanks to your persistence it did. I keep remembering all these little things as I reflect on all the values I have gained by being a beekeeper. I will never stop learning as long as I can visit the bee yards and visit with other beekeepers.

Thanks to all of you that have been part of my most wonderful adventure.

From Havers To Keepers

Rick Cooper