JAN 2007

Bee Culture

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

JANUARY 2007 VOLUME 135 NUMBER 1

Kelvin, Richard and Bret Adee, of Adee Honey Farms. See the story about the biggest beekeeping operation in the universe on page 32. (photo by Kim Flottum)

FEATURES

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Subscription Information
U.S., one year, $23.50; two years, $44. Newsstand price: $4.99. All other countries, (U.S. Currency only), $15.00 per year additional for postage. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), January 2007, Volume 135, Issue 1, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

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

DEPARTMENTS & COLUMNS

Back To The Bees

A thank you note for your magazine. I'm 47 years old and from about 11 years of age to about 20 or 21 I kept bees on my dad's farm – until about 1981 or 82. Then I sold them. I loved the smell of an open hive and fresh honey.

Now I'm looking forward to raising bees again and your magazine is really helping me decide how to get back into it correctly.

A lot has changed since last raising bees. Mites are new to me. I feel like Rip Van Winkle. After a long nap of 20 years I wake up to mites. After every magazine I get from you I wonder if I really need a beesuit and veil. I'm thinking I need a chemical suit and a gas mask. And a Ph.D. in chemistry to raise bees.

The main reason I want to go back to raising bees other than the fact my children are grown and I now have the time, I miss seeing bees in the wild. You never see bees working flowers anymore. It's so sad.

I do not want to use chemicals and due to my job I travel a lot and really do not think I could use them correctly if I'm gone a lot.

Based on your articles I plan to go into this with new equipment, high quality strain of bees like the Russians, small cell brood frames, removable mite screen and drone brood frames and keeping lots of honey in the hive.

I really believe investing money in top quality Russian pure strain bees is going to be my best protection.

David L. Cooks
Grayson, KY

Nest Searching Scouts

I will attempt to relate some observations about these bees.

I've always wanted to observe the first scout to find my 'Decoys' and see what transpired after that, (but haven't). What I have noticed is that when that first scout starts looking over a potential nest site she won't go inside for quite some time. This used to make me antsy, until I figured this is the way its done. As she was darting around the entrance, and the box, I would say out loud "go inside."

I have no explnation why they do this, but they do. Are they leaving some scent? I don't believe so, as all of my decoys have a lot of bee smell – dark combs and old boxes with propolis, etc. That's what attracted her in the first place.

Another thing I've observed is that after you have a good deal of recruits, they will start acting 'excited' or at least it appears to me to be excitement. There will be a lot of "running" and at the same time "bumping" into other bees, and 'wiggling.' This can go on for several days. The other thing I found out (which I wrote about before) is prior to the swarm coming or making a *move* to come *all* bees evidently go back to the cluster (or hive if they haven't already swarmed).

After this dissappears the swarm will either come, or the scouts will, slowly, start coming back, and the whole thing starts all over again. I believe they made a move to come, but couldn't make it in one shot either because of distance, or the wind blowing the "scent trail" off. Several times in the past 40 years of putting decoys in our backyard (we have no hives here so I'm sure the bees are all feral). After the scouts, the phone will ring and sure enough it's a swarm in the air, or one just landed in a tree near their house.

I always mark one of the scouts, after quite a few are coming to my decoy, and time them to give a rough idea as to how far away they are. I don't believe it's as accurate as when I hunt bee trees because hunting bee trees the bees are in pretty much of a hurry to get the reward (bee box syrup) back to the colony, whereas the nest scouts are taking *nothing* back to the cluster except information. Sometimes after the process has reached hundreds of bees acting excited I will mark 20 to 50 bees. The main reason for doing this is to see if these marked bees are the first to arrive when the swarm comes. I haven't noticed this to be the case.

Getting back to the phone call. I will get their address and upon arrival will see my marked bees on the cluster, so I know they are the same bees.

Another thing I've noticed after marking 20 to 50 bees is that after some time (a day or so) these marked bees seem to quit coming! I figure they passed the baton on to other recruits so to speak, but that's just a thought.

One other interesting conclusion is several times (three) I've had the swarms cluster 15 to 100 feet from the decoy. Why they couldn't make that last short distance is beyone me. But all three times after clustering the scout started the ritual all over again, except in one instance the distance was about 100 yards. The scouts started coming back to my decoy, but after ½ hour almost all activity stopped. I had good access to the swarm and could observe the dance. They were doing the same maneuver – wiggling the same driection. But after the scouts quit the decoy, the dance completely reversed itself.

The conclusion I came up with, was wind direction, it was blowing from the cluster back toward my decoy hive going back to when I first observed the scouts and watching to see which direction they were leaving. I paid little attention to the wind, but now know it would have been a crosswind. The most interesting part of this event, was after the disappearance of the scouts the swarm never came, but about 15 minutes later one or two bees came back. So I figured they had made a move to come. About this time my cell phone rang, it was my wife, she had gotten a call about a swarm. The address was just down the street from where I was, so I went to see. They said the air was full of bees, and by their description it would have been the same time the scouts had disappeared. They also watched them

going down the street into a bunch of willow trees, and this is where I found them.

This now brings us back to the present. The bees giving up on my decoy and the dance changing 180°.

The bees were hanging about knee high on one willow limb ½ inch in diameter. I had a big urge to pack my decoy hive to where the cluster was, and then cut the limb and pack the cluster back to where the decoy had been. In other words reverse the whole thing. But I had already made a dozen trips back and forth with my video camera, videoing both decoy and cluster and seeing I was in a residential area and being over 70 years old and noticing two people watching my moves with skepticism, I decided not to press my luck. But it would have been an interesting experiment.

What I finally did was bring the decoy to the bees and physically hive them as I was sure this bunch would have been lost.

I find swarm movement to be one of the more interesting parts of beekeeping, and also believe this is where the answer to the controversy of the dance manuever is to be found.

I have never witnessed 'shot gunning' as Walt named it, but you can be sure I will be looking, especially when it's swarming time, and the sun is just right.

Jim Cowan
Aberdeen, WA

Bees & Tar

Can you shed some light on an old (Civil War or earlier) Southern cliche?

"I'm as busy as a bee in a tar bucket."

Are bees attracted to tar? (I thought tar was more or less liquid smoke after slowly burning pine wood.)

Anon.

Skunk Issues

Several writers have commented on skunk problems. Several traps (leg or killer) around will take them. The kill types usually prevent smell. Try Fur Fish Game magazine.

As for the skunk, extract and sell the scent gland. Stretch and sell the skin, eat the meat. Skunks are cleaner than chickens. The organ meat is more nutritious.

Jim Doerr
Fairfield, CA

Good Job BC

Let me just say I have truly enjoyed and appreciated (and SAVED) every article, every issue of my subscription this last year. I believe one would be hard pressed to find all your excellent information on their own, in a timely manner.

What a service you provide to your subscribers! Thank you.

Marjorie Smith
St. Albans, ME

INNER COVER

Leadership Medina County is a Nonprofit, Education and Leadership Development Program. It is designed to provide first hand exposure of the issues facing Medina county to future and current business and community leaders, and to assist them in addressing those issues. Business and government types - Suits - attend a series of in-depth lectures, tours and demonstrations over several months that explore the many aspects of our life and times in the county and the community. The goal is that they will absorb what they see and learn, and couple that with what they already know, to become a positive force and an exceptional role model in future leadership roles. All in all, the county is a better place for this activity since everyone gains from having better informed and skilled business and community leaders.

Most every county has a group like this I understand, and large cities have their own groups. Perhaps you or someone you know has been associated with a local program. I suspect it was an experience well worth the effort.

These programs get their money from tuition fees, membership dues, and sponsorships, and the A. I. Root Company has been active in this area, providing meeting facilities, programs, and even students. Moreover, both John Root and Brad Root have been active in the Medina Chapter as instructors or serving on Committees.

Every other year the Medina County group chooses a select few individuals that have achieved success in accomplishing goals and displaying exemplary leadership over a sustained amount of time and in several venues. This past December they honored John Root, our Company President and Chairman of the Board. He's also the guy who hired me...which further reflects, I suppose, his wisdom and leadership. Below is the inscription on the Plaque he received that night.

Excellence in Business Leadership Award

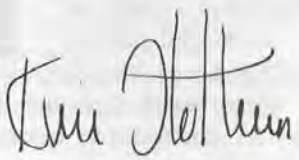
As the President and Chairman of the Board of The A. I. Root Company, John Root oversees a business that has been an integral part of Medina County since 1869, producing candles renowned worldwide for their beauty and quality craftsmanship. A distinguished leader, John believes that cooperation and motivation are vital to success, an idea which he has modeled not only through his business, but throughout the community as well.

After serving as an Air Force pilot during the Korean War, John returned to Medina and joined The A. I. Root Company, taking the family business beyond beekeeping and religious candles and into the decorative candle market. During his fifty-three years with the company, John has directed its growth, expanded its business nationally and globally, and initiated capital improvements that led to the creation of new jobs. Today, he continues to focus on assembling and motivating a strong team, leading Root Candles into the global marketplace of the 21st century.

John has served on the boards of many organizations within Medina County, including Medina City Council, the Medina Chamber of Commerce, Medina General Hospital, Old Phoenix Bank and Westfield Insurance. By promoting a spirit of cooperation, motivating others and giving sound advice, John has helped these and other organizations bring tremendous business and industrial growth to Medina County, along with the creation of new jobs and the expansion of modern health care facilities.

For the past 137 years, The A. I. Root Company has provided thousands of Medina County families with good employment and economic stability. Not only has John successfully nurtured the growth of the family business into its fifth generation, but he has helped to facilitate the growth of business and industry throughout the county. Dedicated to making Medina County a better place to live, John Root is a remarkable business leader and an inspiration to others.

I couldn't have said it better. Congratulations, John.



Congratulations John

Status Of Pollination In North America

Excerpts From The Report

You've probably read, and heard a lot about pollinators lately. They've been in the news, on stamps, and will have their own special month next year.

All of this comes from the release of a multi-year study conducted by a swarm of prominent scientists from 20 universities.

The report takes a long hard look at the whole world of pollinators – bees, bats, birds and the rest – assesses their current status, and makes recommendations about improving their lot.

We've taken some of the most interesting info they gathered on honey bees and offer it here. If you want, you can download all 350+ pages for free, or buy the report for $50+ at www.nap.edu. Here is part one of the best of this report.

Committee On Status Of Pollinators In North America
May Berenbaum (Chair), University of IL, Urbana-Campaign
Peter Bernhardt, St. Louis University, Missouri
Stephen Buchmann, University of Arizona, Tucson
Nicholas W. Calderone, Cornell University, Ithaca, New York
Paul Goldstein, FL Museum of Natural History, Gainesville
David W. Inouye, University of Maryland, College Park
Peter Kevan, University of Guelph, Ontario, Canada
Claire Kremen, University of California, Berkeley
Rodrigo Medellin, Universidad Nacional Autonoma de Mexico
Taylor Ricketts, World Wildlife Fund, Washington, DC
Gene E. Robinson, University of IL, Urbana-Champaign
Allison A. Snow, Ohio State University, Columbus
Scott M. Swinton, Michigan State University, East Lansing
Leonard B. Thien, Tulane University, New Orleans, LA
F. Christian Thompson, Systematic Entomology Lab, USDA

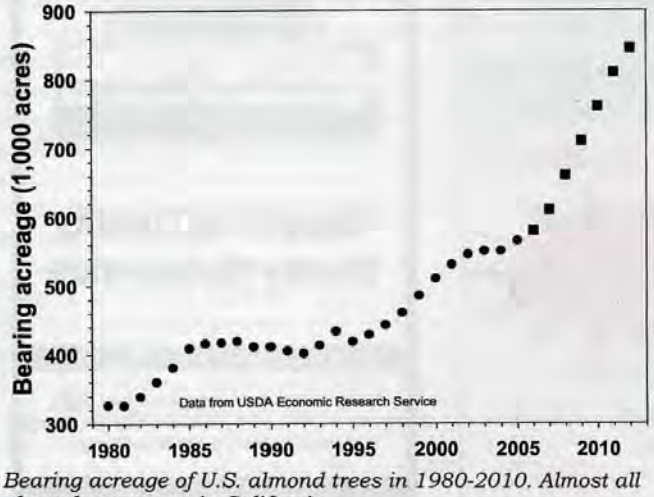
Pollination Management

Recognition of the mechanisms of biotic pollination led to important agricultural innovation, with extensive economic consequences; management of pollinator species allowed for enhanced crop productivity and for commercialization (and export) of numerous crop plants. In North America, only a handful of pollinator species are actively managed – that, they are semi-domesticated, produced in large quantities, and bought and sold commercially. Of these, *Apis mellifera* L., the western honey bee, is the premier actively managed pollinator worldwide, highly valued for its activity as a pollinator and for its production of wax and honey (McGregor, 1976; Free, 1993; Kearns et al., 1998; Delaplane and Mayer, 2000).

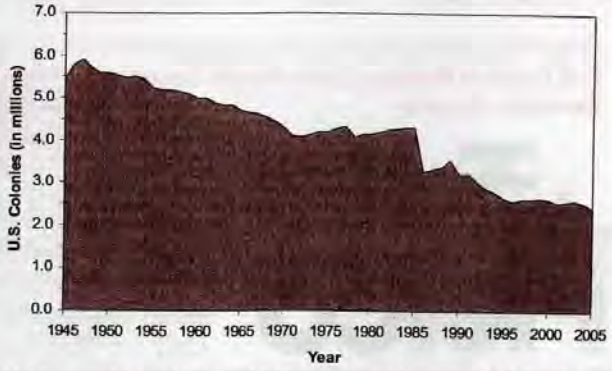
Native to Eurasia, the honey bee has been hunted for its honey and wax for at least 6000 years (Crane, 1983, 1990) and records of semi-domestication and hive management date back to ancient Egypt (Crane, 1999). *A. mellifera* rapidly became the primary pollinator for modern agriculture, and managed colonies were transported around the world, first arriving in North America with European colonists in the 1600s (Sheppard, 1989a). Modern apiculture in North America dates to 1862, when L.L. Langstroth, a Philadelphia minister who kept bees as a hobby, exploited the concept of "bee space" to construct movable-frame, top-bar hives that allowed beekeepers to harvest honey, manipulate their colonies, and increase efficiency without harming the bees (Langstroth, 1862). Langstroth's invention resulted in the large-scale commercial beekeeping and honey industry that exists today.

Honey bees pollinate more than 100 commercially grown crops in North America (McGregor, 1976; Free, 1993; Kearns et al., 1998; Delaplane and Mayer, 2000). In the United States, about 135,000 beekeepers manage 2.4 million colonies of honey bees. Most beekeepers (about 94 percent) are hobbyists with 25 colonies or fewer. Another five percent are called sideliners, each managing 25-300 colonies. Only about one percent are commercial beekeepers and they generally manage between 300 and 60,000 colonies each to provide most of the nation's pollination services (D. Weaver, The American Beekeeping Federation, presentation to the committee on October 19, 2005).

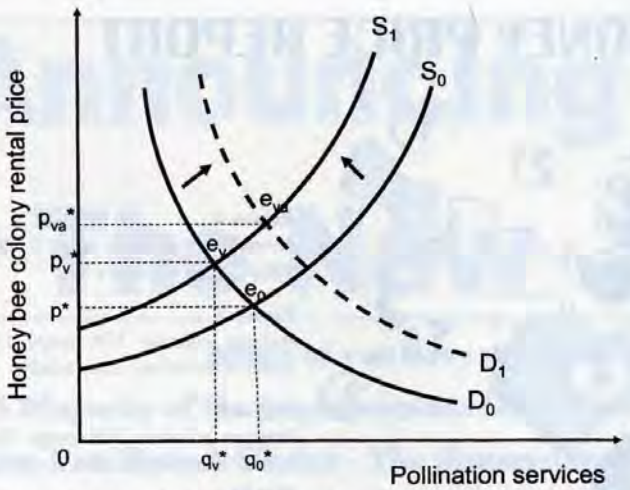
Beekeepers in the United States have formed hundreds of local associations and two national trade organizations. The American Beekeeping Federation (ABF) has about 1200 members (ABF, 2005), and the American Honey Producers Association (AHPA) has about 500 members (S. Parks, AHPA, personal communication, June 12, 2006). The Eastern Apicultural Society (EAS), Heartland Apicultural Association (HAS) and the Western Apicultural Society (WAS) meet annually and provide extensive educational opportunities for beekeepers. Many beekeepers, however, do not belong to any formal organization.



Bearing acreage of U.S. almond trees in 1980-2010. Almost all almonds ae grown in California.
• Historical data from USDA Economic Research Service.
Data from a presentation by the Almond Board Bee Task Force (Heintz, 2005).



U.S. honey bee colonies, 1945-2005. Data compiled from USDA-NASS (1995, 1999, 2004a, 2005a, 2006).



Honey bee population declines raise bee production and maintenance costs, reducing the commercial supply of pollination services offered at all price levels from S_0 to S_1, and raising the market price and reducing the marketed quantity of honey bee colony rentals from e_0 to e_v. Agricultural demand for pollination services could rise (from D_0 to D_1) as feral honey bees and native pollinators decrease in abundance or as crop acreage rises (as in almonds), increasing both the equilibrium price and the quantity to point e_{va}.

Value Of Pollination

Pollination as a biotic process has both commercial and ecological value. In the context of agriculture, pollination provides a wide range of benefits to a broad diversity of commodities across North America. In some cases, production of the commodity itself results directly from the act of pollination (for example, fruit production). In other cases, although pollination does not result in production of the commodity itself, the process contributes to crop propagation (for example, production of seeds used to grow a root crop such as carrots) or quality (for example, size of tomatoes has been linked to repeated pollination). There are indirect benefits as well, through food-chain relationships. Alfalfa seed, a bee-pollinated crop with an annual value of $109 million (direct effect), is used to produce hay for livestock forage that is valued at $4.6 billion per year (indirect effect) (Morse and Calderone, 2000). Although these indirect effects tend to exaggerate the economic value of pollination, they have been used in several widely cited studies.

The annual value of honey bee pollination to U.S. agriculture has been variously estimated at $150 million (Rucker et al., 2005), $1.6 billion (Southwick and Southwick, 1989) $5.7 billion (Southwick and Southwick, 1992), $9 billion (Robinson et al., 1989a), $14.6 billion (Morse and Calderone, 2000), and $18.9 billion (Levin, 1983). The annual benefit of honey bee pollination in Canada has been estimated at $443 million by Scott-Dupree and colleagues (1995). More recent data are shown on the website of the Canadian Honey Council (http://www.honeycouncil.ca/users/folder.asp). The lowest U.S. figure is an estimate of the annual value of pollination fees actually paid by farmers (Rucker et al., 2005) – a value that does not capture the higher fees that farmers would be willing to pay to ensure good pollination. Studies that include estimates of such willingness to pay for pollination services provide a breakdown of total reported values as direct benefits to crops, indirect benefits to crops, and indirect benefits to livestock. The value of direct benefits to crops clusters in the range of $5 billion to $10 billion (the higher end adjusted to 2005 dollars). Values reported by Morse and Calderone (2000) and by Levin (1983) include indirect benefits of the honey bee pollination required for seed production in alfalfa hay, asparagus, broccoli, carrot, cauliflower, celery, onion, and sugar beet. Levin (1983) included 10 percent of the value of cattle and dairy production that he attributed to alfalfa hay whose seed requires bee pollination. Attributing the full market value of such indirect effects to pollination exaggerates the economic value of pollination services, because indirect products like alfalfa hay or cattle require many production inputs besides from alfalfa seed. Even the alfalfa seed made possible by pollination also requires that farmers provide other costly production inputs. Given the estimates currently available, consistent comparisons can be made across those economic values based on the direct effects of pollinators.

The economic consequences of pollinator shortages in agriculture hinge on six determining factors: a specific need for animal pollination, a crop yield gain contributed by the pollinator, the crop price, the cost of pollination services, the value of marketed byproducts (such as honey), and the availability of alternative means of pollination.

Predicting the direct, short-run economic consequences of population declines in honey bees – the principal managed pollinator species – is not straightforward. Microeconomic theory predicts two effects; both increase pollination fees. The first is a rise in cost of producing and maintaining commercial bees. This increase reduces the quantity of pollinators that can be supplied at any price. The second is an increase in demand for commercial honey bee pollination caused by decreases in feral bee colonies and native pollinator numbers or by an increase in acreage or floral density of pollinator-dependent crops.

FUNDING AND STAFFING ARS BEE RESEARCH

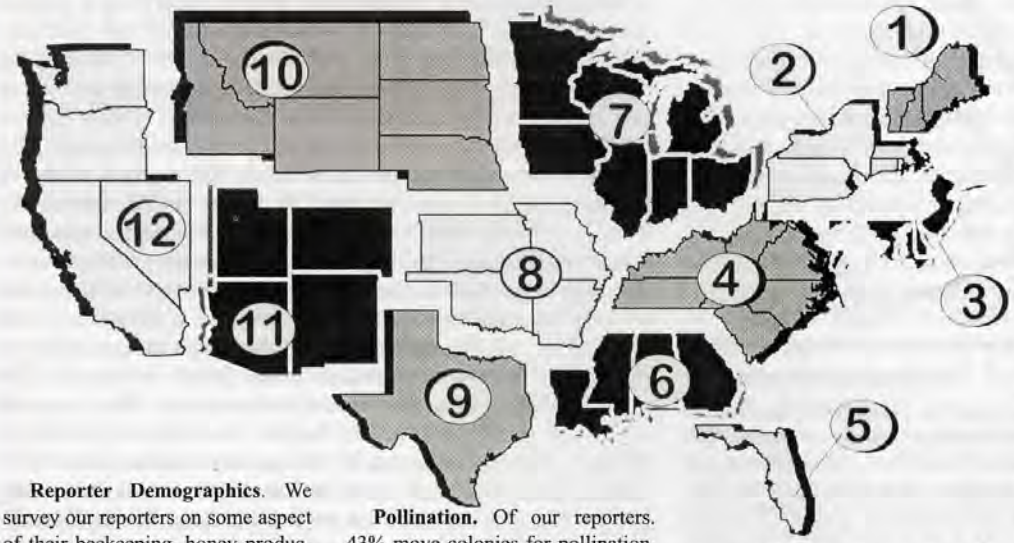
Fiscal Year	Funding ($U.S.)	Full-Time Permanent Staff Scientists
1996	5,574,000	23
1997	5,913,000	23
1998	6,380,00	23
1999	6,599,000	26
2000	7,009,000	26
2001	7,629,000	27
2002	8,037,000	25
2003	8,450,000	25
2004	8,844,000	27
2005	8,861,000	27
2006	9,227,000	24

Source: USDA-ARS

ARS Honey Bee Research

Much of the applied research on honey bees in the United States is conducted in ARS honey bee laboratories. Research funding has increased from $5.6 million in 1996 to $9.2 million in 2006, although the number of full-time scientists has declined since 2003. Some of the approaches to preventing or reversing pollinator decline outlined in this chapter depend on strong ARS involvement in honey bee research. Maintaining current research support and restoring lost scientist positions – with a special focus on honey bee pollination – at ARS is critical to pollinator conservation and restoration. BC

JANUARY – REGIONAL HONEY PRICE REPORT



Reporter Demographics. We survey our reporters on some aspect of their beekeeping, honey production and marketing nearly every month. This time we're looking at numbers and range of colonies, yield/colony this year, and pollination.

Numbers of Colonies. 52% of all reporters have 50 or fewer colonies. 23% have between 51 and 200, and 25% have more than 200. 11% have more than 1,000, while 14% have 10 or fewer.

Yield/Colony. Average yield, across all regions, and all reporters, was 63/lbs./colony. The range across regions was a low of 39, in Region 4, to a high of 95, in Region 5. The Sunshine State wins.

Pollination. Of our reporters. 43% move colonies for pollination, 57% don't. Not surprisingly, reporters in eight of the 12 regions move to almonds (1,3,7,8,9,10,11,12). Though not reporters, we are aware of beekeepers in the remaining regions who do almonds also. That crop, certainly, has changed U.S. beekeeping. Contracts? 40% use them, 60% don't. Almond pollinators lead the way. There's a message in that.

New Crop Sales. 27% are seeing improvements, 65% are the same, and 5% see few sales this season.

Where Are The Bees? Not surprisingly, 84% of our reporters keep their bees in the country, away from towns. 10% keep them in the suburbs of cities of 20,000 or greater, and 6% in towns of less than 20,000. When it comes to the proportion of colonies – 97% of all colonies are in the country. No surprise there.

Region 1
Average colonies 280; range 8-1,500; 50#s/colony; sales average.

Region 2
Average colonies 210; range 50-300; 40#s/colony; sales average.

Region 3
Average colonies 700; range 3-2,000; 40#s/colony; sales average.

Region 4
Average colonies 70; range 5-500; 39#s/colony/ sales up a bit.

Region 5
Average colonies 350; range 15-1,000; 95#s/colony; sales steady.

Region 6
Average colonies 275; range 30-1,000; 76#s/colony/ sales steady to up a bit.

Region 7
Average colonies 275; range 15-2,000; 43#s/colony/ sales steady to up.

Region 8
Average colonies 110; range 70-150; 70#s/colony; sales up.

Region 9
Average colonies 450; range 5-2,200; 88#s/colony; sales steady.

Region 10
Average colonies 53; range 5-200; 87#s/colony; sales steady.

Region 11
Average colonies 80; range 10-220; 65#s/colony; sales steady.

Region 12
Average colonies 250; range 15-1,000; 60#s/colony; sales steady.

	REPORTING REGIONS												SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.00	1.25	1.07	1.12	1.06	1.10	1.04	1.07	0.81	0.94	0.95	1.25	0.81-1.25	1.06	1.07	0.95
55 Gal. Drum, Ambr	0.98	1.00	0.98	1.10	0.81	0.95	0.96	0.98	0.80	0.98	1.25	1.25	0.80-1.25	1.00	0.99	0.83
60# Light (retail)	96.00	120.33	120.00	101.21	100.00	140.00	104.50	91.67	120.00	129.03	132.00	171.50	91.67-171.50	118.85	109.09	103.08
60# Amber (retail)	96.00	111.67	120.00	100.80	100.00	121.25	102.14	95.00	150.00	130.82	128.00	151.67	95.00-151.67	117.28	106.37	97.24
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	44.64	55.98	41.40	40.99	49.98	32.50	42.70	49.98	49.98	35.76	40.00	60.40	32.50-60.40	45.36	45.94	46.83
1# 24/case	61.44	65.28	69.00	59.75	63.00	65.00	62.98	55.80	49.92	77.56	94.80	83.40	49.92-94.80	67.33	65.71	60.83
2# 12/case	61.68	62.32	66.30	54.45	58.50	52.50	54.81	65.54	45.20	57.84	49.00	76.40	45.20-76.40	58.71	57.53	55.27
12.oz. Plas. 24/cs	57.12	59.28	52.80	48.85	46.00	56.50	50.96	42.00	40.64	47.64	66.00	66.00	40.64-66.00	52.82	53.55	52.40
5# 6/case	65.04	68.99	70.50	57.95	67.25	63.00	61.58	50.00	55.50	56.43	56.00	80.33	50.00-80.33	62.71	63.13	61.13
Quarts 12/case	88.13	100.35	88.13	82.30	81.00	75.88	81.68	69.00	88.13	110.00	83.40	122.00	69.00-122.00	89.17	91.57	78.82
Pints 12/case	49.96	49.95	49.96	49.50	53.00	46.14	49.20	39.00	37.80	49.50	32.00	64.00	32.00-64.00	47.50	52.52	48.14
RETAIL SHELF PRICES																
1/2#	2.75	2.68	2.23	2.66	1.79	2.45	2.69	2.45	2.89	2.22	2.29	3.92	1.79-3.92	2.58	2.52	2.73
12 oz. Plastic	3.25	3.36	3.33	3.17	3.57	3.25	3.06	3.40	3.23	3.06	2.81	4.06	2.81-4.06	3.29	3.17	3.10
1# Glass/Plastic	3.81	3.90	4.13	3.94	3.59	3.87	3.72	4.24	4.10	3.92	3.42	5.55	3.42-5.55	4.02	3.98	3.84
2# Glass/Plastic	7.50	6.59	7.86	5.95	5.80	6.02	6.11	7.75	6.62	6.58	5.71	10.00	5.71-10.00	6.87	6.82	6.59
Pint	6.03	7.38	6.03	5.14	5.93	5.03	5.52	5.25	5.83	6.42	5.77	7.08	5.03-7.38	5.95	6.12	5.86
Quart	11.47	8.98	11.47	9.17	8.28	8.28	9.01	8.49	11.27	13.46	7.80	12.42	7.80-13.46	10.01	9.48	9.16
5# Glass/Plastic	14.67	13.66	18.43	14.24	15.00	13.25	13.54	16.00	12.69	13.80	12.51	19.50	12.51-19.50	14.77	14.58	13.34
1# Cream	4.38	5.50	4.89	4.73	5.50	3.80	5.50	4.29	5.50	5.00	4.99	5.00	3.80-5.50	4.92	4.90	5.32
1# Cut Comb	5.00	4.98	5.19	4.93	7.14	4.02	5.25	4.50	7.14	6.00	3.50	8.63	3.50-8.63	5.52	5.67	5.52
Ross Round	5.33	3.97	5.19	5.08	5.33	4.00	4.78	4.00	5.33	6.00	4.50	7.50	3.97-7.50	5.08	5.34	4.91
Wholesale Wax (Lt)	2.25	2.45	1.93	1.83	1.70	2.54	2.04	2.00	2.50	2.42	1.48	2.25	1.48-2.54	2.11	2.33	2.20
Wholesale Wax (Dk)	1.58	2.07	1.80	1.67	1.60	2.56	2.15	2.37	2.00	2.37	1.80	2.00	1.58-2.56	2.00	2.07	1.77
Pollination Fee/Col.	60.00	75.00	52.50	36.00	41.00	43.67	47.83	83.57	83.57	83.57	25.00	102.50	25.00-102.50	61.19	51.49	63.33

Malcolm T. Sanford

Just Say NO To African Honey Bees

"Plus, dealing with the media, and EHB certification (circa 1992)."

At the October, 2006 Florida State Beekeepers Association convention, Mr. Bill Vanderput gave one of the best presented and informed discussions of Africanized honey bee management I have experienced. If anyone should know about these insects, it would be Mr. Vanderput. He was quoted in Dr. Eric Mussen's newsletter, *From the UC Apiaries* as saying the Africanized honey bee means "...25 percent more stings, 25 percent more work (cost) and 25 percent more sweat."[1]

Not only was he one of the first U.S. beekeepers to experience first hand the invasion, but he also has had experience with their progenitors in their native homeland. In 1987, in response to reports about the Africanized bee (AHB), an American hybrid of the African honey bee race, *Apis mellifera scutella*, he boarded a plane for South Africa. His colleagues on the Dark Continent were to pooh pooh his fears by saying, "Hey, forget about it! You're getting a great hard-working bee. Be happy. Use it, but be careful."

So in 1990, when one of the first swarms of AHB landed near his bee yard in the vicinity of Hidalgo, Texas, Mr. Vanderput was prepared. The bee did well in his environment as was true in most of the American tropics. It was vigorous, efficient and pest and disease tolerant. So much so that he now finds himself surrounded by wild (feral) AHB.

His mission in coming to Florida was to advise beekeepers on how he manages AHB and continues to survive, even thrive as a beekeeper in south Texas. Many, however, were not prepared for his message, "just say no to Africanized bees."

The message he delivered to Florida beekeepers did not register with Mr. Vanderput himself for the first few years after AHB arrived. His plan was to use locally-produced EHB queen cells to introduce as much European honey bee genetic material as possible. He knew that the first cross between EHB mothers and AHB fathers was often productive and not as defensive. Thus, his idea was to maintain a population of first crosses (geneticists call them F1) as they are able to do in Mexico. This philosophy fit Mr. Vanderput's situation. He had always been enthusiastic about the queen rearing process, and this allowed him to ramp up his activities in that arena. In addition, he didn't have to radically change his beekeeping management.

Unfortunately, experience revealed the F1 hybrid does not persist for any period of time, and quickly through supersedure it goes to F2 and F3 colonies, which are more and more African-like especially in defensive behavior. And although he might have been able to work through this, it became apparent that this would not be possible in his environment.

Even in rural, south Texas, there is a trend toward urbanization. This, in conjunction with a litigious environment, is a recipe for beekeeping problems posed by defensive honey bees. After moving bees from a watermelon field one evening, Mr. Vanderput was informed the next morning that a grower had to bring in a helicopter to spray bees that were left behind. They were stinging the field hands. A neighbor moved next to a beeyard and was attacked when he fired up his lawnmower. He lost that location. Power line workers were stung while working on poles lining the road way when a truck load of beehives went by. That incident cost Mr. Vanderput's insurance company $18,000. His insurance was cancelled. A beekeeper sold four colonies to another, and when they were moved, one of the helpers got stung and died before he could be taken to the hospital. The suit resulted in a $2 million settlement.

After five years of "denial," Mr. Vanderput said, he was forced to reconsider his management practices. Instead of including them as an integral part of his operation, Mr. Vanderput has gone to "cold turkey abstinence," by excluding AHB totally. The way he accomplishes this is simple:

1. Use only mated queens from European bee sources for requeening, not queen cells.
2. Destroy any queens from colonies that exhibit AHB behavior.

The first step above was difficult because it meant purchasing queens. Mr. Vanderput said he labored under the idea that it was too costly and he would be dependent on others (queen producers). He found that instead of being too expensive, purchasing queens provided a boost to his business, plus a huge bonus: peace of mind. Thus, each year he purchases some 2,000 queens, which often pay for themselves with quicker honey production.

It is easy to detect AHB colonies Mr. Vanderput said because of their behavior. He characterized it as "shock and awe." They are not calm on the comb when manipulated, but instead fly off and "in an instant they will be all over your bee suit and gloves." That's when he employs his counter weapon, an "improvised shaker box." This consists of an empty super on top of a queen excluder. Shaking all the bees through the ex-

Continued on Page 18

Dealing With The Media

For topics that are controversial such as pesticide poisoning, honey contamination, and stinging incidents, I have published some suggestions on how to deal with the media developed at a crisis communications workshop conducted at a Florida Beekeepers Institute in 1992. These include:

1. **Individual Rights** – No one from the press has the right to violate your individual rights.

2. **Honesty** – Never mislead or lie to a reporter. If the situation is under litigation, say this is so; if there is a question about profits, dollars or proprietary information, you can defer/refuse answering based on not informing competitors in the marketplace.

3. **Buzz Words** – Never repeat an expression or inflammatory statement made by a reporter. As an example, if you are asked to what do you attribute this catastrophe, do not repeat the word "catastrophe." It then becomes attributable to you and you alone; you will "own" it.

4. **Hostility** – Never get angry; keep cool and remember the reporter always has the last word.

5. **Off the Record** – There is no such thing; if you don't want it reported, don't say it.

6. **Estimates** – Never make numerical estimates in time or dollars. Say that the incident is under investigation and you will provide accurate information when it becomes available.

7. **Reporter Verification** – Ask for identification, the purpose of a reporter's activities, media affiliation and telephone number.

8. **Bridging** – Try to bridge the gap between a reporter's wish to be negative and providing a positive statement about your activity.

9. **Statistics** – If you are not aware of statistics provided by a reporter, say so and ask for them in writing before commenting.

10. **Deadlines** – All reporters are on deadlines, but you are not. Take all the time necessary to avoid hasty comments. The fact that a microphone is stuck in your face doesn't mean you have to say something. Dead air time is not likely to appear on television.

An offensively oriented public relations/communications plan is the best defense against sensationalistic reporting based on negativism. It is best to have a communications plan in place and persons trained in this area. Defer all questions to one or two designated (and trained) persons to avoid giving conflicting information. The appointing and training of designated persons to speak for the group would be a good activity for beekeeping associations both now and in the future.[1]

Reference:

1. Sanford, M.T. 1992. *Apis Newsletter*, Vol. 18, No. 8, August, accessed November 20, 2006 http://apis.ifas.ufl.edu/apis92/apaug92.htm#1.

Certification Of European Honey Bees

The following suggestions were developed at an intensive workshop[1] conducted in St. Louis Missouri in 1991:

"CERTIFICATION PROCEDURES FOR EUROPEAN HONEY BEES - Colonies without clipped or marked queens in regulated areas will be permitted to move from a regulated zone to a non- regulated zone if requeened with (1) certified breeder queens; (2) queens produced from certified breeder queens (to be called certified production queens); or (3) certified queen cells. Colonies may also be certified to move using the current USDA identification method known as FABIS or USDA- ID.

"A certified breeder queen is one in which the progeny can be certified as European by: a) Fast Africanized Bee Identification System (FABIS); b) Official Universal System for the Detection of Africanized honey bees (USDA-ID); and c) any other APHIS-approved identification technique. Queens produced and mated in areas free of Africanized honey bees will not require certification. All certified breeder queens must be clipped and marked. These queens can be used to produce other certified breeder queens or drone-producing colonies.

"A certified production queen is one produced from larvae of a certified breeder queen. Certified production queens cannot be used to produce other certified production queens, but can be used as drone-producing colonies.

"A certified queen cell is any containing a larva from a certified breeder queen. The resulting queen emerging from a certified production cell is a certified production queen.

"Queen and Package Bee Producers – Except where special regulations may require, queen and package bee producers will not require certification in non-regulated areas. Those in regulated areas must use certified breeder queens for cell and queen production and requeen or make splits using certified queens or cells. It is strongly recommended that all certified production queens be marked and clipped for ready identification.

"Producers of Certified Breeder Queens – Certified breeder queens are to be certified by state regulatory agencies using FABIS or USDA-ID. Other methods of certification must be approved by USDA/APHIS. Certification is based on emerging worker progeny or examination of worker bees collected at the entrance at least six weeks after successful queen introduction. Certified breeder queens must be marked and clipped to be readily identified by bee inspectors and other regulatory officials.

"Mating Yard Procedures – A minimum of 60 European drone-source colonies must be established for each 1,000 or fewer mating nuclei. All such drone-source colonies should be located within 1/4 mile radius of the mating yard. No drones may be introduced into colonies and mating nuclei unless originating from certified breeder queens or certified production queens. Producers of either certified breeder or production queens must requeen drone-producing colonies annually.

"Swarms – The practice of catching swarms and using them in beekeeping operations is no longer justifiable in regulated areas. All swarms captured in regulated areas must be destroyed.

"Abandoned Apiaries – All abandoned apiaries located within two miles of queen rearing yards must be destroyed.

"Semen Certification – Drone semen from regulated areas can be certified by progeny tests of worker bees. No certification will be required for semen obtained from non-regulated areas."[3]

Reference:

1. Sanford, M.T. 1992. *Apis Newsletter*, Vol. 18, No. 8, August, accessed November 20, 2006 http://apis.ifas.ufl.edu/apis92/apjan92.htm#2.

cluder exposes the queen "struggling" to get away. She can easily be caught and destroyed. In 24-hours, this now queenless colony can be united to a queen-right unit.

Best management practices being developed by Florida's Department of Agriculture and Consumer Services, Division of Plant Industry with the aid of its Honey Bee Technical Council were distributed at the Florida State Beekeepers Association convention, and can be found on the World Wide Web.[2] They incorporate many of the suggestions developed at an intensive workshop on the subject conducted in St. Louis Missouri in 1991. However, Mr. Vanderput counseled that any best management practices encouraging raising queen cells in AHB-inhabited areas are fraught with potential problems. They do not fit his "total abstinence" policy rooted in EHB queens mated to EHB drones with any possible AHB genetic influence completely eliminated.

Some ideas on how to deal with the media were provided by Mr. Vanderput. He ensures that no managed colony (box or hive) is ever photographed as part of any story about a stinging incident. His philosophy is that these two things should be kept in separate compartments in peoples' minds.

Mr. Vanderput's resultant message to Florida beekeepers in AHB-populated areas: "Africanized bees are none of your business if you want to keep your business." Said another way, "If you want a peaceful life so you can sleep at night, just say no to Africanized honey bees." AHB will be part of the environment (they have their "green card"), but these immigrants should not be given shelter in managed hives. Treat them as you would other stinging insects like yellowjackets, hornets or bumble bees. The more you eliminate AHB from your operation the more your insurance company, banker and bee inspector will like you. "Just think of the benefits if the word gets around that Florida beekeepers don't tolerate Africanized bees in their hives." BC

Dr. Sanford is a former Extension Specialist in apiculture at the University of Florida.

References:

1. Sanford, M.T. 1992. *Apis Newsletter*, Vol. 12, No. 1, January, accessed November 20, 2006 apis.ifas.ufl.edu/apis94/apjan94.htm#1
2. FL Dept. of Agriculture, Division of Plant Industry web site, accessed November 20, 2006, www.doacs.state.fl.us/pi/plantinsp/apiary/apiary.html.

? DO YOU KNOW ?

Getting Better

Clarence **Collison**
Mississippi State University

Beekeepers have many opportunities to increase their beekeeping knowledge by attending various conferences, meetings, demonstrations, short courses, and workshops. In addition, there is a wealth of printed material available on honey bees. At our recent MS Beekeepers' Association meeting one of the topics of the meeting was covered by a panel, discussing common mistakes made by beginners. As would be expected, the topic generated a lot of lively discussion. In beekeeping, a great deal of knowledge is gained by learning from your mistakes and trying new approaches. Keep reading and take advantage of the educational opportunities available to you.

Take a few minutes and answer the following questions to see how you are progressing.

Level 1 Beekeeping

1. ____ Queen, drone and worker honey bees effectively groom honey bee tracheal mites off from their bodies. (True or False)
2. ____ Eggs are laid on the inner side of the cappings, and sometimes the walls, of cells full of honey.
   A. Small hive beetle B. Greater wax moth
   C. Bee louse D. Lesser wax moth E. *Varroa* mite
3. ____ The highest infestation levels for nosema disease and honey bee tracheal mites would be found in colonies in the Fall of the year. (True or False)
4. ____ *Acarapis externus*, *Acarapis dorsalis* and *Acarapis woodi* are found in the U.S. (True or False)
5. ____ Both *Acarapis externus* and *Acarapis dorsalis* feed on adult honey bee blood. (True or False)
6. ____ Female *Acarapis externus* and *Acarapis dorsalis* lay their eggs in worker brood cells. (True or False)
7. ____ *Varroa* mites have been shown to vector numerous pathogens to honey bees. (True or False)
8. Frames that have the end bars wider at the top than the bottom to provide the proper spacing when frames are placed in the hive are called _____ self-spacing frames.
   A. Root B. Hoffman C. Demuth D. Mehring
   E. Hruschka
9. ____ The valve-fold is associated with the queen's mid-gut. (True or False)
10. ____ The "K-wing" condition of adult worker honey bees may be associated with a colony suffering from nosema disease and honey bee tracheal mites. (True or False)
11. ____ Treatment of stored combs with paradichlorobenzene (PDB) crystals requires that the crystals be placed in the bottoms of the stacked supers since the gas is lighter than air. (True or False)
12. ____ Paradichlorobenzene (PDB) crystals kill all stages of wax moth. (True or False)
13. Please identify this early season floral source. (1 point)

Advanced Beekeeping

14. ____ As a colony is making preparations to swarm, there is a lower level of juvenile hormone within the workers hemolymph, after queen cells are present. (True or False)
15. ____ *Tropilaelaps clareae* was first discovered as a parasitic mite on *Apis dorsata*. (True or False)
16. ____ *Tropilaelaps clareae* is believed to be as great a hazard to world beekeeping as the *Varroa* mite. (True or False)
17. ____ When *Varroa* mites and *Tropilaelaps clareae* are found within the same brood cell, *Varroa* mites seem to outcompete *T. clareae*. (True or False)
18. ____ *Tropilaelaps clareae* like *Varroa* mites prefer to reproduce in drone brood. (True or False)
19. ____ The three major honey bee endocrine glands: the prothoracic gland, corpora cardiaca and corpora allata, are found in both adults and larvae. (True or False)
20. ____ Italian honey bee colonies build up faster than Russian honey bee colonies early in the Spring. (True or False)
21. ____ There is strong evidence that there is an egg marking pheromone and the Dufours gland is likely the source of the pheromone. (True or False)
22. ____ Russian honey bees show resistance to both *Varroa* mites and honey bee tracheal mites. (True or False)
23. ____ Russian honey bees exhibit frugal food use during the Winter. (True or False)
24. ____ Young worker house bees have high hemolymph juvenile hormone (JH) titres and rates of JH biosynthesis rates, whereas foragers have low JH titres and biosynthesis rates. (True or False)
25. ____ Foraging honey bees have significantly higher levels of neurochemical amines (octopamine, dopamine and serotonin) within the brain's antennal lobes, mushroom bodies and remaining deuto/protcerebra than young house bees. (True or False)
26. ____ Define a false queen. (1 point)

ANSWERS ON NEXT PAGE

?Do You Know? Answers

1. False Resistance to tracheal mites is based chiefly on the ability of worker bees to groom mites off themselves as mites are moving from bee to bee. Drones and queens appear to lack the ability.
2. C) Bee louse
3. False Tracheal mite and nosema levels increase over the Winter during periods of confinement and highest levels are normally found in the Spring.
4. **True** *Acarapis woodi,* the honey bee tracheal mite, was first found in the United States in 1984 in Texas and rapidly spread throughout the United States. In the United States, the first external *Acarapis* detected was *Acarapis dorsalis* in New York in 1930. *Acarapis externus* and *Acarapis dorsalis* are widely distributed in the United States.
5. **True** Even though *Acarapis dorsalis* and *Acarapis externus* are external parasites, both are blood feeders like *Acarapis woodi,* but have been reported to cause no visible symptoms of injury to their adult hosts.
6. **False** *Acarapis externus* and *Acarapis dorsalis* lay their eggs on the exterior surface of the adult honey bee. *Acarapis dorsalis* lays its eggs singly in the dorsal scutoscutellar groove of the bee thorax. *Acarapis externus* uses a gummy substance to form clumps of eggs in the neck region of the host.
7. **True** *Varroa* mites are known to be associated with numerous honey bee pathogens and are confirmed in some cases to be vectors of disease. The mites transmit numerous viruses to their hosts through their saliva when feeding.
8. B) Hoffman
9. **False** The valve-fold of the queen is associated with her reproductive system. It is a tongue-like structure which can close the passage between the vagina and the median oviduct of the queen.
10. **True** Colonies that are suffering from either nosema disease or a tracheal mite infestation may have some bees crawling around the hive entrance and on the bottom board showing the "K- wing" condition. The rear wings are usually at an abnormal angle, unhooked from the front wings.
11. **False** Paradichlorobenzene crystals should be placed on top of frames in the top super of the stack of supers. It is heavier than air and will seep down through the combs.
12. **False** Paradichlorobenzene crystals (PDB) kill wax moth adults and immature stages, but not eggs, and repels moths and prohibits egg laying.
13. Skunk Cabbage- Found in low swampy places throughout Eastern North America and westward to Iowa. It blooms very early, often with snow still on the ground. It is an early source of pollen.
14. **True** Juvenile hormone titres are lower in worker honey bees in colonies that are preparing to swarm in comparison to normal colonies, when queen cells are present in the preswarming colonies. This suggests that behavioral development is delayed in workers that are preparing to swarm in comparison to normal colonies. This is consistent with reports that preswarming colonies have reduced foraging activities.
15. **False** *Tropilaelaps clareae* was first discovered as a parasite of *Apis mellifera* brood and was later found on *Apis dorsata.*
16. **True** *Tropilaelaps clareae* is believed to be as great a hazard to world beekeeping as the varroa mite.
17. **False** When both *Tropilaelaps clareae* and *Varroa destructor* are found in the same brood cell of *Apis mellifera* larvae and pupae, only *T. clareae* appears to be successful in producing viable progeny.
18. **True** *Tropilaelaps clareae* parasitism of *Apis mellifera* brood is remarkably similar to that of *Varroa destructor.* Parasitism levels of 80 to 90% in drone brood have been observed.
19. **False** The prothoracic gland is found only in the larva. The gland produces ecdysone, the hormone involved in molting.
20. **True** Italian honey bees produce populous colonies in the Spring whereas Russian honey bees overwinter relatively smaller populations of bees and build up slower in the Spring.
21. **True** There is strong evidence that a queen-produced egg marking pheromone exists. This pheromone is used by policing workers to distinguish between queen-laid and worker-laid eggs. The Dufour's gland very likely produces some or all of this pheromone or stores and secretes some or all of the pheromone.
22. **True** Russian honey bees are known to have significant resistance to both honey bee tracheal mites and *Varroa* mites.
23. **True** Russian honey bees exhibit frugal use of food stores.
24. **False** Juvenile hormone (JH) has been shown to be involved in the regulation of honey bee age-related division of labor. Young workers specializing in tasks inside the nest have low hemolymph JH titres and rates of JH biosynthesis, whereas foragers have high JH titres and biosynthesis rates.
25. **True** As the adult honey bee transitions through the age-related division of labor, there is an age-dependent increase in the brain neurochemical amines. Octopamine, serotonin, and dopamine are found in significantly higher levels in older bees than in younger bees within the brain's antennal lobes, mushroom bodies and remaining deuto/protocerebra.
26. False queens are worker bees that occur in queenless colonies and can attract a small but recognizable retinue of workers around them. False queens morphologically are workers but the amount of pheromone in their mandibular glands is intermediate between a typical queen and a worker.

There were 13 points in each test level this month. Check below to see how you did. If you scored less than six, do not be discouraged. Keep studying – you will do better in the future.

Number Of Points Correct
13-11 Excellent
10-8 Good
7-6 Fair

Bee Disease, Bee Sex and "Curiously Promiscuous" Queens

Larry Connor

Diversity, it seems, is all it's cracked up to be.

Most beekeepers become familiar with bee diseases – from chalkbrood, sacbrood, and the foulbroods, European and American – all too quickly. They learn there are many more, especially the viruses associated with parasitic mites. Viruses and mites (or is it mites and viruses) provide a "one-two" punch for a lot of beekeepers. I suspect a lot of beekeepers are like me when thinking about bee diseases – they think that the key to disease control it to keep a colony "healthy." But what do you have to do to achieve that healthy state? Do you avoid contact with all other colonies (good luck), keep your bees confined to a certain foraging area (please, please tell me just how to you plan to do that?) and well fed and growing? Perhaps you were taught that having disease in your hives meant that you were a bad beekeeper. Some of us act that way and try to hide the problem.

So, if you are like me, you might be surprised to learn that researchers have been looking at the relationship between disease (in all organisms as well as bees) and how they are responsible for two remarkable biological events: the development of sex (male-female exchange of genetic materials) and the evolutionary pressure for the development of queens that mate with more than one drone.

The Red Queen and the Evolution of Sex

Lets take these concepts – these evolutionary issues – one at a time. We will discuss the development of sex first. In evolutionary biology there is a concept that states that *sex evolved to overcome the constant pressure from disease.* Sex provides the mechanism for a constant genetic recombination of genes, and, the theory argues, is the best method to stay one step ahead of diseases, pests and parasites. This concept was described in a book by English science writer Matt Ridley, titled *The Red Queen: Sex and the Evolution of Human Nature.* The *Red Queen* in question here is not a bee or even an insect; but refers to the Red Queen chess piece in Lewis Carroll's *Through the Looking-Glass* that runs frantically yet remains stationary. Ridley uses the Red Queen as a metaphor to describe the nature of the genetic relationship between host and disease. It has been studied in humans and recently examined in honey bees. The Red Queen's speeding race that gets her nowhere puts reproductive sex in the center of the evolutionary spotlight. While not without controversy, the concept of the Red Queen's struggle on the evolutionary chess set has important lessons beekeepers must apply to our honey bee queens of many colors that we install into our white and multicolored beehives.

Social insects occupy nests that are crowded and humid, perfect conditions, and a highly favorable environment to promote the growth of pathogens and the rapid transmission of diseases from individual to individual. Social insects have evolved elaborate and complicated behaviors that help manage disease. For example, in cer-

Queen purchased in a queen cage from a Southern shipper shows a high degree of uniformity in the color and banding patterns of the workers. This strongly suggests that the drone supply was closely related.

Queen and daughter workers at the end of March (2006) after wintering in a five frame nucleus. The queen was reared in New England and mated to local drones (Summer 2005). No effort was made to control the composition of the drone supply. The appearance of several worker color patterns strongly suggests the presence of highly diverse drone genetics. The only sure way to determine differences in paternity is through DNA analysis. This colony had no apparent disease infestation upon inspection.

Appearance of bottom board of the colony headed by the queen in photo number 1. Research by Tarpy and Seeley suggest that colonies that lack genetic diversity may be more likely to have large disease outbreaks.

tain leaf-cutting ants, a caste of tiny farmer ants constantly monitor the fungi growing on the leaf pieces, and are small enough and quick enough to remove sections of any harmful fungus whenever it appears in the leaf farms of the colony. This allows the ants to grow without contamination only the species or strain of fungus that they use for food. Ironically, these tiny ants react much faster than human farmers who rarely note a disease or pest problem until it has become widespread and difficult to control – in this case there is a huge advantage to being tiny and able to work among food you are growing.

In honey bees, of course, we have discovered the process of hygienic behavior, where bees somehow detect defective brood cells – ones that have a bad odor or some other cue that stimulates the bees to remove the cell's contents. Remarkably, this same genetic mechanism has been shown to successfully work on a number of very different, highly unrelated diseases and even mites: American foulbrood, chalkbrood, virus-killed brood, chilled brood, and, of course, *Varroa* mites are all managed using the same basic cell cleaning mechanism. Some have predicted that the hygienic stocks from Minnesota, SMR/VSR, Russian and others will all be found to demonstrate some variation or even the identical genetic hygienic mechanism as outlined by Professor Walter Rothenbuhler in the mid 1950s.

Advantages of multiple mating

If we accept the idea that the best way to distribute adaptive genetic mutations and changes protective to the genome of a species is through sex, we are still faced with an explanation of why bees of the genus *Apis* have evolved the behavior of mating multiple times, using Drone Congregation Areas (DCA's) where queens mate with a dozen or more drones during a short time interval. What is the advantage of one queen mating so many times?

Most insects mate only once, and within the social insects the examples of multiple mating have been reported in *Vespula* (yellow jacket wasps), *Atta* (leaf-cutter ants), *Pogonomyrmex* (harvester ants), and *Dorylus* and *Eciton* (army ants). But the social insects with the highest level of multiple mating are all in the genus *Apis*, with queens of *Apis mellifera* mating with 12 drones on average as based on molecular genotyping.

North Carolina State University researcher David Tarpy and Cornell scientist Tom Seeley have worked with queens mated to different numbers of drones and examined their ability to counteract disease. We will review some of their work to examine the role of multiple mating in the overall success of the honey bee.

Tarpy and Seeley studied the "curious promiscuity" of queen bees and how the queen's multiple mating behavior impacts the hive's disease levels. There must be a huge evolutionary payback for a species to invest in the complicated mating system found in the honey bee species. Rather than mating in or around the nest, virgin honey bee queens and drones fly to drone congregation areas (DCAs) to mate. On their flight they are exposed to predators, high winds, sudden changes in the weather, and may make orientation mistakes returning to the proper hive. Why does a queen mate multiple times and then stop for the rest of her life?

Sex and the Single Queen

To answer this question, I reviewed two related papers. The first is by David Tarpy and compares queens that have been instrumentally inseminated with either one drone (SDI) or with many drones (MDI).[1] In the second paper, Tarpy and Cornell's Tom Seeley (where Tarpy had worked as a post-doc before being hired by NCSU) set up a similar study to evaluate different colonies[2]. In each paper they produced two groups of colonies. One group consisted of highly related virgin queens that were instrumentally mated with the semen of just one drone, each drone taken from an unrelated colony. The second group of queens was instrumentally mated with an identical volume of semen collected from unrelated drones – one each from the colonies used in the first group. After the semen was collected and mixed, one micro-liter of semen was given to each queen. This is the same amount of semen given to each queen mated to a single drone. This second group of queens were mated in such a way as to duplicate the number of drones the average queen mates with in the wild, but under highly controlled conditions. Once established in production hives, the colonies were examined for disease and general aspects of beekeeping. The two groups of colonies allowed the researchers to compare colonies mated to one drone, called monandrous colonies, where the worker bees were genetically uniform; with colonies mated with multiple drones, called polyandrous colonies, and where the resulting colonies had genetically diverse worker bees. The experiment allowed them to examine any possible advantage of polyandry.

Colonies were set up and managed for six weeks so they had worker

[1] Tarpy, D.R. 2002. Genetic diversity within honeybee colonies prevents severe infections and promotes colony growth. Proc. R. Soc. London B 270: 99-103

[2] Tarpy, D.R and T.D. Seeley. 2006. Lower disease infections in honeybee (*Apis mellifera*) colonies headed by polyandrous vs monandrous queens. *Naturwissenschften*, 93: 195-199.

bees from the queen. At that time, each colony was inoculated with spores of chalkbrood fed in pollen patties. Infected brood was counted and compared between the two groups.

The results show that the colonies with a diverse number of drones had a lower *variation* in disease development when compared to the colonies with a queen mated to a single drone. Tarpy concluded that genetically diverse colonies (polyandrous) may be better able to resist severe infections of chalkbrood because they reduce the variability found in the occurrence of disease. These colonies did express some chalkbrood, but not at the extremely high or the extremely low levels found in the monandrous colonies. Genetic variation has been shown to exist in bee populations for most bee diseases and mites, including chalkbrood, *Varroa destructor, Acarapis woodi, Nosema apis*, and American foulbrood. Tarpy's study indicated that polyandrous colonies were less likely to experience a severe chalkbrood infestation. He wrote "that increased genetic diversity within colonies provides them with several benefits, and thus should be viewed as a trait with pluralistic consequences."

Lower Disease Infections With Multiple Mating

In the second study Tarpy conducted in cooperation with Tom Seeley, various techniques were refined, so while the methods used in the two experiments were not identical they were very similar. Again single-drone inseminated queens were produced and compared to multiple-drone inseminated queens and their resulting colonies. In the second study, the colonies were exposed to natural conditions and evaluated for the presence and frequency of bee diseases. Of note is that of the 20 final colonies, 80% had one or more of four diseases: sacbrood, chalkbrood, European foulbrood or American foulbrood. Of these, the MDI colonies had less variability in both chalkbrood and in all disease combined. Colonies headed by MDI queen had significantly more comb and more frames of brood.

These results show that with increased genetic diversity multipley inseminated queen colonies may produce subgroups (sometimes called *super sisters*) of worker bees with unique behavioral skills. It is thought these subgroups may be specialized in doing certain chores, like finding food resources or maintaining a more uniform brood nest environment. Second, the multiple drone mating reduces the chance of having the same allele for the sex gene, and reduces the amount of missed brood due to diploid drone removal. Third, the increased diversity of the colony may mean that colonies are more likely to moderate the levels of diseases and parasites in the colonies.

Of these three ideas, this research supports the third concept, of reduced disease. But the study does not contradict the first two concepts, for "the genetically more diverse colonies may have benefited in multiple ways."

The ecology of honey bee colonies is significantly affected by disease; even in colonies started as swarms on new equipment showed four brood pathogens in less than two months. It reflects the overwhelming role of disease in our colonies' life cycle. The test colonies were kept in pairs and were widely separated and not manipulated during the experiment.

Lessons for Beekeepers

Since I grew up with the old Starline/Midnite technology of creating inbred lines to cross via instrumental insemination to create hybrid bees, I was trained to develop large numbers colonies of genetically uniform hives. Queens were very closely related and so were the drones they mated with. The key was to develop highly uniform bees, hives with hybrid vigor that made them more productive. The goal was to produce hybrid colonies that all required the same management at the same time – every hive gets two supers today – that sort of thinking. Our diseases were the two foulbroods, a little sacbrood, the newly introduced chalkbrood, and silent battles with *Nosema apis*. Many beekeepers used drugs (we were likely to call them medications), and we kept treating on a regular basis.

I suspect this genetic uniformity had no tolerance against either the tracheal mite or the *Varroa* mite. We lost a lot of colonies, and while I have argued that we lost a great deal of genetic diversity, we certainly lost a huge number of very uniform, highly susceptible stocks.

We did not talk about diversity except to test new queens for possible integration into the hybrid program. Many queen lines were evaluated but precious few were integrated; the queens that failed to make the cut were pinched off and the stock rejected from the program.

Now beekeepers are looking at ways to increase diversity in the bees. The work of Tom Seeley and David Tarpy shows the advantage in having a large number of unrelated drones mate with queens and thus provide a mechanism to reduce the extreme cases of disease. Over the next decade I hope that individual beekeepers, or some of the new bee breeding groups that are developing around the country, will be able to identify certain genetic strengths in their stocks, and that all beekeepers may include such stocks in a drone saturation plan to increase the genetic diversity of the drones their virgin queens will mate to.

At the end of Tarpy and Seeley's second paper, the authors write: "The curiously high promiscuity of honey bee queens is an adaptation to minimize the impact of the litany of parasites that threaten their colonies. More generally, the findings of this study, together with the many studies supporting the Red Queen hypothesis for the evolution of sexual reproduction, suggest that disease is a fundamentally important agent in natural selection and that genetic diversity plays a key role in minimizing fitness losses imposed by disease." BC

Larry Connor runs Wicwas Press and is a regular contributor to these pages and you can reach him at LJConnor@aol.com.

The Largest Beekeeping Operation In The Universe

Kim Flottum

In July last year I spent the better part of a week visiting Adee Honey Farms at their headquarters in tiny Bruce, South Dakota. It was the beginning of harvest season, so extracting was in full swing. Witnessing this seasonal spectacle is much like walking into any commercial-sized food manufacturing facility – large, fast and efficient.

Because this is the largest beekeeping operation in the U.S. their very size allows them to do many things within an economy of scale that is out of reach of many smaller businesses.

Since beekeeping businesses rarely compete on a head-to-head basis – other than the occasional beeyard trespass – the competitive advantage Adee's possess is best used to make bulk purchases from suppliers; when selling honey to packers, handlers and exporters; and when negotiating pollination arrangements with growers. Thus, Adees are seldom competing for market share, but rather they stay in the eternal struggle to reduce costs, increase the margins on what they sell, and produce even more of those products they, and their bees manufacture.

But harvesting is only one facet of this well-run operation, and only occupies a short, though intense part of the year. To get a better handle on how this operation runs, we're going to follow an entire year of Adee Honey Farms, beginning with what they are doing this month, then following them through the rest of the year.

Some of this will be updates from a series of articles published here in 1992, and again in 1999, noting things that haven't changed and the many that have.

To accomplish a review of a business this size within a time frame this long, the undivided attention of all of the Adee family was required, and, even in the midst of harvest, everyone made time to carefully answer the questions of an outsider, to show, and sometimes show again how things work, and to explain all of the detail required in how each part of this operation works, and how each of the parts fit together to make this the largest beekeeping operation . . . in the universe.

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Adee Honey Farms is headquartered in Bruce, South Dakota. Today they have regional headquarters in Bakersfield, California; Cedar Rapids, Nebraska; Roscoe, South Dakota; Bon Wier, Texas and Woodville, Mississippi. They also have smaller units in Sisseton, Kimble, Salem, Clark and Vivian, South Dakota and Ansley, Nebraska. They have beeyards in Minnesota and North Dakota, also. This past Summer they were running just over 70,000 colonies.

Richard Adee oversees this multistate operation, along with his two sons, Bret and Kelvin. Richard started this business in 1957, when he was 21 while attending business college in Northpark, Illinois. He'd grown up with bees as a kid at home in Nebraska because his father, Vernon and four uncles kept bees to supplement their incomes as teachers. Richard already had 300 colonies back home in Nebraska when he bought those 1,600 colonies in Bruce, South Dakota. There was an overwintering spot in Woodville, Mississippi that came with the deal.

For the next 30 or so years the emphasis,

Three generations of the Adee family work to keep this operation going strong.

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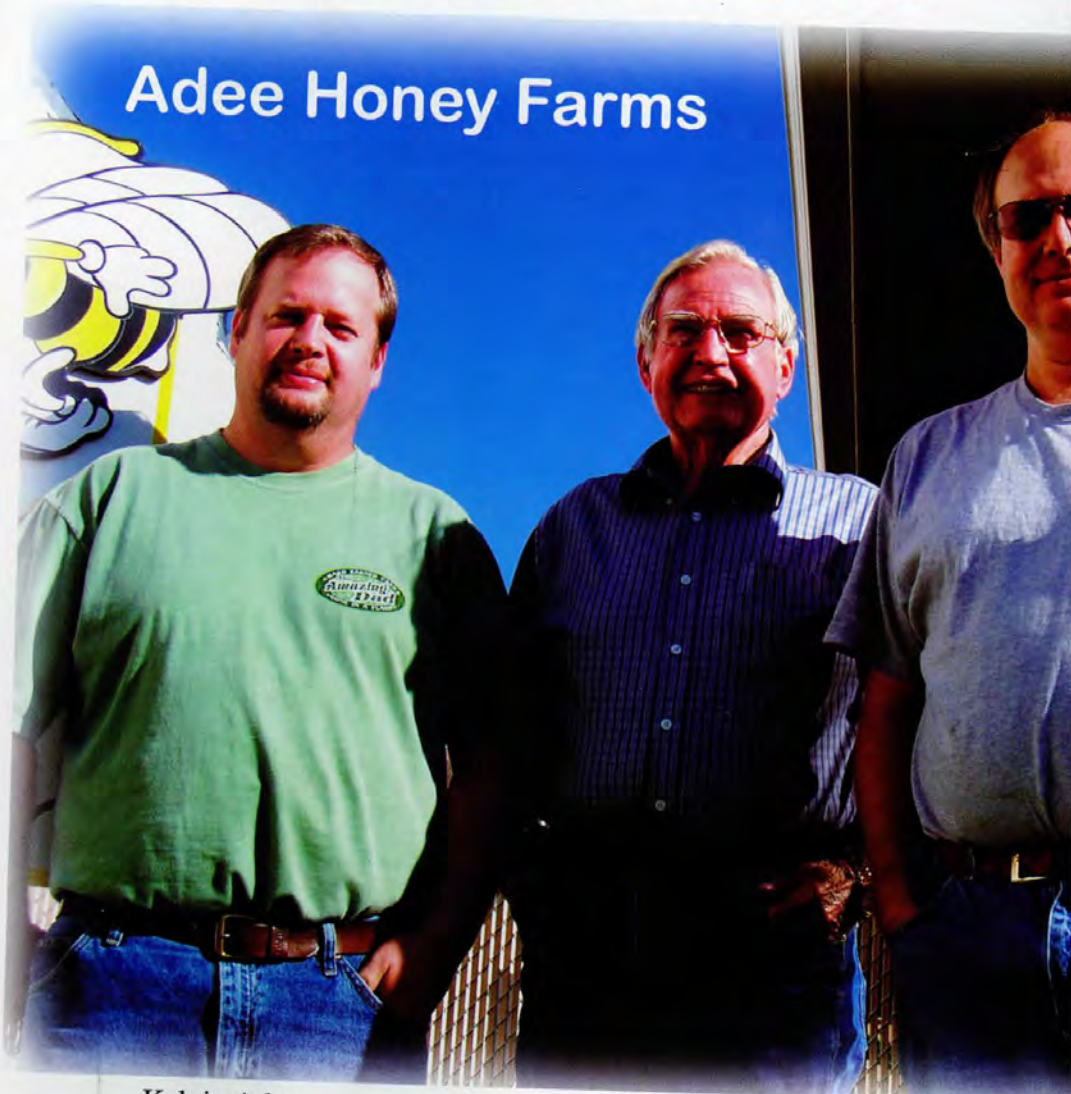

Kelvin Adee Richard Adee Br

Not To California

During late Summer, just before and during harvest, the breeder colonies for next season's queen production are established in South Dakota. Soon, these colonies, and a truckload of production colonies are moved to the Mississippi and Texas queen production locations.

Later, during the Winter, deadouts from the midwest are sorted out and prepared for making splits after California pollination. The five-frame nucs are also sent south for the same reason, after being made ready for bees.

Breeder queens arrive in South Dakota and are installed and established during the Summer. Each breeder queen colony is coded to source and other information.

Empty equipment, ready for bees in Mississippi.

A breeder queen yard is established in the Fall.

Every 10-framer sits on an identical, home-made pallet. Colonies are moveable on these pallets, forward a couple of inches, to reduce moisture buildup between colonies. However, sides are still close together. Brood boxes last six to seven years, supers much longer because of this.

the focus and everything Adees did was directed at making honey. The operation grew by making good business decisions on what and when to purchase equipment and having a keen sense of honey bee biology.

In the 60s they bought an operation near Cedar Rapids, Nebraska, three years later one in Kansas, 10 years later another in Kansas and more in Minnesota. They've continued acquiring the operations of beekeepers who've retired or gone out of business. Often these acquisitions are for prime honey producing locations in the Midwest, where beeyard locations are regulated.

In the early 90s it became obvious that honey was no longer the only game in town and Adee Honey Farms had to look to the future – and the future was almond pollination. After contacts with brokers and growers a trial run of 1,600 colonies was made. Pollination remained migratory for a bit, but it was soon obvious that more permanent control was needed, so Adee's rented a warehouse and Bret moved west to oversee this part of their operation.

Quickly it became clear that their entire business model should accommodate and in fact embrace almond pollination as an integral part of their year. So, instead of moving colonies from the Midwest to Mississippi right after harvest, plus overwintering many in Nebraska, as they had been doing for years, moving the whole lot to California early in the Fall, spending time, money and energy getting them in top shape to pollinate almonds was not only possible, but profitable. In 1999 they moved nearly all of their 40,000 colonies to their Bakersfield holding yard, and this year, it will be nearly 70,000.

After almond pollination wraps up at the end of March, colonies can go any number of directions. Some go northwest to pollinate apples. When finished there they return to the Midwest to make honey.

Some colonies may stay in California to make honey or pollinate other crops if weather cooperates, but the

balance move to either Mississippi or the new Texas operation, to be split, and have new queens added.

By early July all the colonies are back in the Midwest and set for honey production. Splits are fed as soon as they arrive and colonies are supered in anticipation of the clover, alfalfa and soybean flows, and harvest season is just over the horizon. In between is enough rain, enough forage, and enough luck.

CALIFORNIA TIME

By early January, the hundreds of truckloads of Adee's colonies have arrived at the holding yard near Bakersfield. They've been arriving for a month or so, most coming from Bruce and Roscoe, South Dakota, after the harvest, with some arriving from Nebraska, where additional colonies were harvested in August and September.

Honey production wasn't up to standard in 2006 and delivered colonies are lighter than Bret Adee likes, but he's geared up to feed, feed, feed – both carbohydrates and proteins – to get them in fighting trim and ready for the big event that starts in late February – Almond Pollination.

Bret Adee steers the California operation, but his brother Kelvin is there for the shear joy of feeding bees, moving bees, and getting trucks out of the mud.

When colonies arrive in the holding yard they are unloaded in groups according to arrival date and the size of the truck that will move them later. Moreover, they are set to accommodate easy record keeping and feeding later. Of course colonies that have just been harvested are thinking down time is just around the corner, so a good jolt of carbohydrate – high fructose corn syrup and/or sucrose – is fed in a one-gallon in-hive feeder. Every colony gets an entrance reducer to stop robbing, and every colony gets a quick once over checking for queens, health and pests. They still lose some during moves, and these are removed.

As soon as possible they start feeding protein, a custom blend made in their operation using a huge com-

Painting Boxes

New supers are all treated the same way. Before assembly, stacks of sides are dipped once in a food grade copper-based wood preservative. Supers are then assembled when the wood is dry. Once dry, they are dipped in the same compound again. When dry, each has a coat of white stain applied for additional preservation. Then, each gets two coats of white latex air-sprayed on, and touched up with a roller.

Even with this preparation brood boxes last only six to seven years, but honey supers 12 – 15.

Unassembled, once-dipped supers.

Once dipped, supers are assembled and branded.

Then dipped again, painted with a white stain . . .

. . . and finally, two coats of latex are applied.

Liquid Feeding

When colonies need to be fed liquid – HFCS or sucrose or some mix – the same system is used in every location. This allows every employee the advantage of knowing how to do everything, no matter where they are. It makes getting replacement parts easier, and takes all the guess work out of the system.

The feeding system is very basic. If feed is to be cut with water – say HFCS 55 – because it is thick, a known quantity of syrup from a huge holding tank, and a known amount of water from another tank are pumped in the exact ratio, and a repeatable known mix is made every time.

Once mixed, the resulting solution is pumped into a 500 gallon tank on the feeding crew's truck. At the same time, a 100 gallon tank, that also sits on the truck, is filled with compressed air. Tanks are mounted on fork-lift ready platforms for quick and easy loading and unloading.

When both tanks are full the crew goes to the bee-yard. Using a diesel-style nozzle, while one crew member removes the covers, and then replaces them, the inhive feeders are filled by the other crew member.

The beauty of this is that there are no moving parts to break, no pumps to quit, and no air brake hoses or hook ups to go wrong.

The system is consistent across all locations, is simple to operate, and doesn't break down. It is as fool proof as it can be for non-mechanically-inclined employees.

Feeding tank with 500 gallons syrup and 100 gallon air tank.

The air-loading system. The field shut-off to the feeder tank is easy to use.

Compressed air is fed into the feeder tank, and it pushes out syrup.

A sophisticated mixing tank is used to mix syrup and water to an exact formula.

Syrup is dispensed with a diesel fuel type valve.

One gallon, in-hive feeders are in every colony.

Holding yard in California. Each group of colonies is one semi load.

mercial sized blender. The dry ingredients include Mann Lake's Bee Pro®, brewer's yeast and powdered egg yolk. This is mixed with syrup, made into patties and every colony is fed. Patties are placed between brood boxes for maximum availability right where the bees need it.

The goal, says Bret, is to clean up any colonies with problems, requeen any that need it, and to put lots of healthy, third generation California bees in the orchards starting in late February.

Since Adee's have been in the California scene for several years now they have many established customers, but because they continue to expand the number of colonies they have they always need to find more. Almond acreage expansion has absorbed much, but certainly not all of Adee's additional colonies. This is becoming easier as the reputation for strong, healthy colonies, delivered on time every time precedes Bret when he makes a sales call. In fact, most business comes to him now, rather than seeking customers.

One notable aspect of this operation is that almost every colony has a fresh coat of paint. At extraction, every box is examined and put into one of three categories – discard, repair/paint, or OK. If it doesn't look good or it needs fixing it gets attended to in the Midwest before shipping. That way every box looks good. And that, says Bret, makes selling a lot easier.

Frames are assembled, glued and stapled . . . by the thousands.

Adees make their own nets, and have their name stenciled conspiciously on each one. Interestingly, these nets get 'borrowed,' and when state border inspectors see the name Adee *on the net, they get passed right through because South Dakota doesn't have a Small Hive Beetle problem. Just a net problem.*

Almond pollination commences about the end of February but moving colonies starts earlier. Adees move 70,000 colonies into orchards in a huge hurry, because almond blossoms, and almond growers don't want to wait. Almond trees, unlike apples or other tree fruit or nut trees can support as many nuts as blossoms produced. So growers want every blossom pollinated. Nor are blossoms, growers or bees influenced by the weather, greasy roads or lack of sleep.

Brett said several years ago that almond pollination was all about confidence. "You can't expect a grower to risk his crop on a beekeeper who has shoddy equipment or trucks that don't run. When a grower hires an operation the size of ours, he knows we aren't one truck, one forklift, or one load deep. If a truck breaks down, a load gets lost, or employees don't show, their crop isn't jeopardized. The machine goes on. We have too many resources at our disposal. The grower never sees a blip."

Colonies get unloaded, if at all possible, on the west side of orchard roads for early morning sun exposure. Contracts run the gammet from handshake to detailed,

Moving Out

Trucks are critical when moving into almond orchards, and every set of wheels counts. The crew that spent time checking, culling and feeding colonies helps get things going. Those colonies that won't be used because they don't muster up due to size or health have been sorted out, and those strong enough are loaded.

Loading, of course starts at early, early dawn. Five-ton 10-wheel trucks with an automatic transmission and a 25 foot bed hold 216 colonies. Two-ton trucks with six wheels and a 22 foot bed hold 128 colonies. Still, that's lots of truck loads to move in a short time. Loading an entire semi, of course, is idel when moving lots of bees, and often happens.

Loaded trucks pull a small trailer that carries the Swinger forklift. Trailers are custom made to accommodate the Swingers.

Finding orchards, and locations within orchards in the dark can be tricky. Excellent maps are needed, and good marking within orchards are important. Is GPS on the horizon?

More and more orchards are providing paved roads to facilitate trucks, but some still don't have this luxury. Rain in February is common, and muddy roads and stuck trucks can be too.

This was, says Kelvin, "The longest day I've ever spent."

and inspections for colony strength do too.

Once placed, the crews return to the holding yard for more, for the same, or another orchard. When complete, an orchard gets double checked to make sure it got all the colonies it was supposed to get, and got them placed just so.

Orchards are picked that hold at least one semi load – 102 pallets – so that when it's time to move out, the truck makes only one stop.

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Meanwhile back in South Dakota, the getting-ready phase of the operation kicks into high gear. Although frames are made almost continuously during the year, the process is the same. Plastic foundation is used exclusively. Frame parts are assembled around the foundation, parts glued, and eight staples put in.

The five-frame nucs that are to be returned to the southern operations also need to get ready. Using frames from dead outs, unused equipment, and new equipment – in that order – drawn combs, and a comb ½ to ¾ full of honey is added to each for feed. Odd frames are gathered together, and may amount to an entire load to be shipped down later.

The five-frames are kept to January or February up north so the wax moth doesn't get to the frames pulled from other colonies. Tops and bottoms are gathered too, and it takes a load a week to get all this equipment south, ready for the splits.

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Once the colonies are set in the orchards, life slows just a tiny bit, and it's time to get ready for the next phase of the operation. That is, loading up, and moving out those 70,000 or so colonies to Mississippi and Texas, to be split, requeened and made ready for the next honey crop. BC

Selling Honey In A Unique Market

Another non-beekeeping aspect of beekeeping.

James E. Tew

We've all heard someone say, *"I'm exhausted."* It's commonplace. But when I tell you that I am presently exhausted, I really mean it. I and my small staff are currently about half way through our annual University Holiday Honey Sale. It's a lot of work. If the workload is so great, why do we continue to conduct this event? Two primary reasons: We make some money and we continue to learn a lot about marketing honey and honey customers.

The unique market

I don't remember the exact year or the particulars of the early sales, but approximately 18 years ago, we began to haul some honey products to the main campus of Ohio State, 100 miles from my lab. We sat our tables in selected academic buildings. The first years were small affairs consisting of a pickup load of simple honey products and a heavy folding table (lots of glass jars as I recall.) As then, we still primarily sell to the OSU campus faculty, staff, and students, but this is a large market base for our small inventory.

Through the years, the event has grown to two trucks, five tables, four workers, and four locations with sales events being conducted for nine days. Our inventory has grown far beyond simple honey products. It's a lot of work requiring many months of preparation.

An observation:

Every year honey weighs the same, but every year, I am a year older. Those of you older than 50 years know what I mean.

The preparation for the sale

Wax products

We generally start with wax products because these store well and still look fresh by the November sale date. Beginning in mid-July, a small group of Ohio State students are hired and trained to pour candles and beeswax moldings. Some years and some students are better than others, but the good news is that all the wax rejects can be re-melted and then re-poured. We try to develop our inventory based on the demand from previous sale years. We use all our wax and are required to buy more each year. The resulting pile of candles is significant and the resulting mess is unavoidable. Wax accumulates on the floor. Rejected wicking is here and there. Molds are broken but my lab does have the pleasant smell of warm wax.

However, the candle component is a task that the students can readily learn compared to some of the honey sale components not yet discussed. The primary problem is that the melted wax is scathing hot.

An observation:

Every season, until the wax component is finished, I worry about fire and injury hazards. The wax is hot, flammable, and requires hours to heat to the proper pouring point. I don't rest easy until this process is finished.

Candy products

We bag bulk candy and buy various pre-packaged honey-based candy products. All food and honey must be properly labeled and weights must be accurate. We use electronic scales to meet this need. The individual bags are heat-sealed, labeled, and stored for later use. Again, these product lines store well so they are processed early in the season.

Christmas candles offered at one of our sales.

Sherry discussing beeswax candles.

Ancillary products

Many other products require purchasing, processing, packaging, and storing, but there is no need to go into detail. Products such as lip balms, hand cream, honey pots, honey dippers, honey sticks, books and educational materials, and chocolate cream honey mints, are examples of the various associated products that we offer.

Honey products

Honey products are the soul of the sale. Depending on availability, five to six flavors of liquid honey, in myriad sizes and jar styles, are carried. Inventory confusion and miscalculations are easy. It's a guess as to how many eight-ounce honey bears of Star Thistle will be needed for our nine-day sale. How many four-ounce Muth jars of Black Locust would satisfy our needs? Guess wrong and we tie up both money and product in unsold inventory. This is not beekeeping but elementary marketing. It feels like fishing – what bait to use and how much bait to buy?

An observation:

Different varieties of honey granulate at different rates. It's frustrating to see honey bottled only a few weeks ago already show signs of granulation. We provide written and verbal information explaining the granulation phenomenon. We explain that our honey is not highly processed and that "sugaring" is normal. Most customers are tolerant.

Honey bottling is one of the last things we do. Our goal is to have the product look as fresh as possible. Several of my previous articles have included discussions on honey pumps and bottling tanks that are directly related to this process. Students find bottling to be boring and preparation of honey contained in drums can actually be frightening. A drum of honey weighs about 640 pounds. Moving drums on and off of our old truck into our lab can be an adventure. Should the drum fall over, someone could get hurt and there will be honey everywhere. Then the honey must be heated in order to pump it. *(Then I worry about drum heaters left on overnight in order to liquefy it. Remember, we are using thinly trained student labor.)* Burned out heating elements, clogged filters, overheated honey pumps, plugged flow lines, tripped circuit breakers, and chronically sticky floors are some common characteristics of honey bottling.

An Observation:

We rarely offer comb honey products, though it sells very well. Unfortunately, it's just not available from beekeepers.

Advertising

The sale locations are promoted through email communications and in various University publications – advertising which is not particularly cheap. How much to advertise and how much to pay are annual questions that never have easy answers. After years of watching the crowd, I sense that most of our sales are due to spontaneous customers stopping by, but we can never know for sure so we try to cover all the advertising bases.

Choosing the right size and flavor.

We also have two collapsible, A-frame signs that go outside the sale site. We did have four of these signs, but two were stolen several years ago. I guess that means they work.

To this point

By now, in our preparatory schedule, it's October. My lab looks like a bomb has gone off in it. Boxes – empty, partially filled, and filled – are everywhere. Honey containers from two ounces to 55-gallons are all over the lab. You can barely walk down the hallway. The floor, though mopped practically every day, is perpetually slightly sticky. Nerves are fraying and weekend work is common. In an average season, at least two honey spills have occurred. Phones ring all the time. Through all of this, everyday tasks must be accomplished. Correspondence conducted, meetings attended, reports completed, bee colonies worked, and satisfying the OSU financial bureaucracies are examples of non-honey sale but necessary daily jobs that cannot be ignored.

The load

Finally, all is (mostly) ready. Sale site contacts have been made and approved, dates selected, and motel reservations covered. It's loading time. In the larger box truck, five-pounders go on first, at the front and on the bottom. One-pounders go on the left side and two-pounders go on the right side. This positioning essentially forms the bottom foundation for all that's stacked on top of the load. Everything else is packed in plastic totes or in traditional cardboard boxes. Knowing where to step on the developing load is important. On the smaller pickup truck, having a utility cover over the back, go the actual sale components. By unloading the pickup first, the sale display is set up. The larger truck serves as a rolling warehouse. While we

rent the pickup from OSU, the larger truck belongs to my lab; however, all the mechanical and maintenance responsibilities go with that ownership.

An observation:

The larger truck has more than 300,000 miles on the odometer. We have to load it heavy. At 65 mph rolling down the interstate, I don't think I could be any more nervous. More about this later.

The trip

Fluid levels, tire pressures, lights, and brakes are all checked and off we go – heavily laden. The box truck (the bigger of the two) leads and the pickup follows. By now, it is early evening and night has fallen. The truck slowly comes up to speed and gently rocks from side to side. I tenderly shift gears in the sloppy transmission. I play the radio so I won't hear the mechanical sounds this high-mileage truck makes under load. Though the load is level, some of the inventory shifts in the back of the truck. I envision honey boxes being turned upside down. Honey splattering. Other drivers, in their high performance cars, whiz by me as though I am dragging my anchor. The truck tires whine. I lose speed going up hills and check my seat belt while I hold the throttle open on the downhill side. I'm not going to lie, I never enjoy this ride.

After 100 miles, we arrive on the main campus where there are about 52,000 students – all seemingly walking around my truck. Pedestrians, bikers, other cars and me – looking for the right gear. We take the box truck to the first sale site, position it, lock it, and leave it there. By now, we are tired and stressed. We use the similarly overloaded small truck to take us to eat fast food and then for a night of fitful sleep.

The sale

At 6:00 am, we start. The folding tables come off first followed by tablecloth covers. Extension cords for the cash register are next and the register is set up. Everything on the pickup comes off on two flat carts. It seems that thousands of trips are required. Some of the sale sites have decent loading docks, but others are miserable for unloading. We commonly have the help of a couple of Ohio State Beekeeper's Association members. I can't thank them enough. We couldn't do it without them. Honey is inherently heavy. There is much to be done, but invariably there are the early shoppers who want to buy immediately. They are the customer and we try to accommodate them, but these premature transitions slow the setup progress. The complete setup process takes about two hours. At 10:00 am, we are officially open for business.

An observation:

About 65% of the customers want to use credit cards. We never have access to phone lines and we can't afford the wireless credit card device so our credit card transactions are done by hand – the old fashioned way.

Innumerable trips are made to the box truck for re-supply inventory or for special orders. The box truck inventory is probably completely moved a half dozen times during the sale. It's dark inside the box truck. Sometimes, it's raining. All the while, customers are waiting. Nothing about this is actual beekeeping.

Sometimes we are overwhelmed with buyers while other times business is slow – even boring. From season to season, demand changes. We sell out of some items while we have entirely too many of other items. We never have "close-outs or special pricing.

An observation:

The average customer seems to like the wholesomeness and quality of honey and honey products. They like the products being assembled by OSU students. Through the years, we have developed a significant number of loyal return customers.

Honey flavors, an area of unresolved weakness

During past sales, we tried to offer honey samples of the various types of honey we were offering. Too often, a significant, sticky mess resulted that was difficult to clean on site. Though it is difficult to describe honey flavors, we absolutely do not offer honey samples. I don't know how to resolve this weakness.

An observation:

Though we have many appreciative American customers, international faculty and students are particularly good honey customers. While it would be improper for me to ask their nationality, clearly many parts of the world have a high regard for quality honey.

At 5:00 pm, all is broken down and reloaded. Trucks are repacked and relocated for the next day's sale. It's hard, heavy work. Particularly hard-hit are our nail cuticles. Our feet hurt and our backs ache. After four days of selling, all is loaded and hauled home, unloaded, re-inventoried, replenished, and a week later, it is all done again. The first week of December, it's over for the year, for all other than residual sales.

Why do it?

The strangest reason – we've done it for years and have many appreciative customers. Other good reasons are: we make fair money and we learn a lot about what other honey marketers are undergoing. We get a chance to talk to thousands of people about the goodness of bees and honey; plus our bosses see us on the job.

In beekeeping, all is not about keeping bees. Yes, this marketing project is exhausting, but so long as our stamina allows, we will continue to have some kind of Honey Sale Fair. It's just what we do. BC

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It's January – Do Something!

Ann Harman

It's the New Year! But by this time your Resolutions, made so cheerfully on New Year's Eve, are being ignored. Across much of the U.S. it is Winter with cold days, frost, snow or rain. Your bees are clustered and don't occupy as much of your time as during the Spring and Summer. So what are you doing?

Well, for one thing, reading a beekeeping magazine – an excellent project. Look for those back issues that came during 2006. (In that stack, over in the corner.) Review those back issues to see if there is something you never got a chance to read. Maybe an article will appear that you can use this coming spring to improve your beekeeping.

Perhaps you have always wanted to write an article to help others with their beekeeping. January is a great time for doing that. It does not matter if your topic is appropriate for midsummer. Write the article now while you have the time. You can submit it for publication now or a bit later (if you don't forget). Any local or state association newsletter editor would be happy (no make that Ecstatic) to receive something of interest.

If you have some experience under your belt you certainly have good information to give to others through an article. But even if you are a beginner you've had both successes and problems, all good items for an article. Solutions for problems and good questions to ask are always welcome.

Do you keep records of what management you do and the results? But more importantly – do you ever go back and review those records? If you have had bees for several years those records can piece together a story of events in your beeyard. Reviewing those records is a very useful project for a cold Winter day. You may discover a pattern that will lead to improved honey production. You may discover something dumb, too, which will serve as a reminder not to do that again!

You don't keep records? Now is the time to start. You can design your own plan for record keeping. Your computer would be an excellent place to start keeping records. One caution – don't make record keeping too detailed or you will never continue with it. As Spring and Summer arrive you will be busy, not only with bees, but with many other projects. So design your record keeping to be simple but still informative.

The 2007 beekeeping equipment catalogs are arriving and now is an ideal time to look through those. If you do not have a "library" of catalogs start one now. Catalogs are like textbooks because you will always learn something from them. Look through the advertisements in this magazine and send for catalogs.

Pay attention to the new pieces of equipment offered. You might want to try some of them this year. To increase your honey sales try different containers. Containers that are becoming popular are the "upside down" ones – those that sit on the cap. I see them being used for ketchup in restaurants. These containers are extremely popular in Europe, not only for honey but other sauces. And they are available for honey.

Before you start complaining about the price of containers, do a little arithmetic. This is a good time of year to review your sales – where you sell, where *could* you sell, what you charge, what *could* you charge. What are your costs of producing and preparing your honey for sale? Make certain that your customers are covering your costs including the jar, lid, label and transportation.

Every year catalogs show a better way to manage your beeswax or to bottle honey. This may be the year you try some comb honey. Many new designs of feeders and screen bottom boards are in the catalogs. Go ahead and try something new this year.

Cold weather is a perfect time to clean up queen excluders. When the wax and propolis is cold it just snaps off. Of course that means you have to leave the warm fireside and brave the cold. And what about repairing and painting equipment? This is a good time of year for repairs because you'll be able to order new equipment before the Spring rush. Most beekeepers wish they had more honey supers, so if you add a few each year you will have enough in several years. Check your smoker bellows – you can buy replacements. Take a look at your bee veil – bees love to wiggle through those small holes. If you use coveralls wash them so that any dried venom is cleaned off. Dried venom in beekeeper's clothing is a source for developing allergic reactions to bee stings. That also applies to those heavy, long bee gloves. Clean them up. Or use the synthetic dishwashing gloves.

Did you get a bee book for Christmas? January is perfect for book reading, but if you didn't get what you really wanted, go back to your equipment catalogs and order the one you *did* want. A good bee book does not necessarily tell you "how-to-do-it." It can be a book that is a pleasure to read; one where you agree with the

author about just how fascinating honey bees can be.

Here's a great project for January – an observation hive. If you do not have one you are missing out on lots of fun – and a few frustrations. You can order an observation hive from a catalog or you can build one. If you decide to build one from scratch be certain that you observe bee space everywhere. No matter which route you take – buy or build – you will benefit from a very useful book: *Observation Hives* by Thomas Webster and Dewey Caron. Here you can find plans for building and suggestions for buying. In addition you will read about bee behavior as seen in the observation hive. This is a wonderful way to learn what bees do inside their home.

You will need to decide whether your observation hive is one that travels, for example to schools and fairs, or will be stationary in your own home. If yours is a traveling hive then you need a sturdy base and plastic sides, not glass. For home you have many options for installation. Your observation hive does not have to be a year-around colony. You can establish it in the Spring, keep it through Summer, and then contribute the bees to another hive in Autumn. I do recommend an elderly queen for it, perhaps one removed during requeening. A young, vigorous queen will very soon use up all the available space in an observation hive. Then the colony swarms or worse, absconds.

Other catalogs are coming in the mail – seed and plant catalogs. Many beekeepers like to see bees hard at work on flowers. You need to include bee-friendly plants in your flower gardens, no matter how small the garden. No, the bees will not make a honey crop. They probably won't collect enough to influence the taste of your honey, but honey is not the point here. The pleasure of seeing bees visiting your flowers is the fascinating part. With selection you can have bees visit from Spring until frost. Many plants attractive to bees are also butterfly plants, which add color and interest to the flower garden.

You will probably be making selections for your vegetable garden, too. Bees would like it very much if you would plant some Summer and Winter squash, pumpkins and cucumbers. An apple tree would also be nice. The small ones on the dwarfing rootstock are even suitable for urban and suburban gardens. Perhaps this is the year to put in a few blackberry and raspberry plants. Always let one of your broccoli plants bloom just to see the enthusiastic bees on the little yellow blossoms.

Chilly Winter weather is an ideal time for cooking – this time with honey. I hope you have some honey cookbooks. A few are available from equipment suppliers. I also suggest you go to the National Honey Board website: honey.com to find delicious recipes. Plan a week-long menu using honey in one dish each day. Vary the menus: today something for breakfast, tomorrow a meat dish, the next day vegetables, and end the week with a magnificent dessert. Cupcakes are popular now so be sure to make some of those. While you are at it, make enough cupcakes to share with someone.

If you are acting as a mentor for a beginning beekeeper now would be a good time to contact that beekeeper. The weather is just too nasty to open up hives but some instruction for the coming Spring would be helpful. If you are the one receiving help from a mentor take a few minutes to think of the questions you want to ask to get ready for Spring. Take good notes so that you don't ask the same question twice. Now put those notes with your bee bucket to take to your hives when bee season starts.

You may want to put your name on swarm lists with the police, firehouse and extension service. Do it now because swarm season always catches us by surprise. Removing bees from houses, barns and sheds may be an increasing task in your area. If such a project appeals to you include that information with the swarm list. Perhaps you've "been there, done that" and want to leave the catching to others. You could serve as a coordinator for your area, directing the calls to other beekeepers living close to the problem.

Oh yes, one more thing. If you need Spring queens and packages you *must* get your orders in right now. In some cases you may be too late, but try anyway. Now go back to the catalogs and look through the queen rearing equipment. Raising a few queens for your own use may be a possibility this year. Take a look at the nuc boxes, too. Instead of packages you could just increase from your own colonies.

The above is just a potpourri of bee things to do in between the football games. Now don't just sit there – this article is finished. Get up and – do something! BC

Ann Harman spends the Winter months getting ready for the next beekeeping season, from her home in Flint Hill, Virginia.

Cold Treating Bee Plant Seeds

Connie Krochmal

Oh, how I hate Winter! Yet, I know it isn't all bad. Cold weather benefits the seeds of some nectar and pollen plants. This helps them overcome dormancy, thus promoting uniform, quick rates of germination. This chilling process is known as stratification.

The length of the required chilling period varies somewhat from one species of bee plant to another. For example, several weeks are enough for some perennials. In the case of certain other nectar and pollen plants, it can be several months. For those species that are known to need a cold treatment, the general rule of thumb is to provide at least four to six weeks unless a specific recommendation is available for that plant.

The chilling can be done outdoors over the Winter months, or indoors in the refrigerator.

Stratifying Seeds Outdoors

Chilling the seeds outdoors has advantages. You get a head start by doing your Spring planting well in advance. This method lets nature provide the chill without cluttering your refrigerator.

There are several ways this can be done outdoors. The simplest method is to plant the seeds in prepared beds where they're to grow. Typically, this is done during the late Fall to early Winter before the ground freezes. Sow the seeds as you normally would. Tamp the soil firmly in place over them. Then, apply a thin layer of mulch to protect the seeds from heavy rains.

The seeds can also be planted in pots or flats outdoors. Usually, this will involve a little more effort than direct sowing in the garden.

Unless you're using new pots or flats, these need to be disinfected in a bleach solution. I mix one part household bleach to nine parts water, and soak the containers for ten minutes. Then, I rinse them thoroughly to remove all residues of the bleach.

Fill the containers with moist potting soil. Leave about an inch or so of empty space at the top. Plant the seeds as you normally would, covering them firmly.

Now comes the next step – deciding where to keep the pots over the Winter months. A shady, protected spot with a northern exposure is ideal.

Assuming the ground hasn't frozen, dig a hole. Then, sink the container into the soil. The top of the pot should be level with the soil surface. You can also store the pots in a cold frame over the Winter.

If you're leaving the containers where they'll be exposed to the elements, spread a thin layer of small gravel over the top of the potting soil. It helps to break the force of the raindrops. This isn't necessary for pots that are stored in cold frames.

When stratifying seeds outdoors in containers, I prefer to keep my pots on the front porch where they'll be protected from heavy rains. To prevent the potting soil from drying out during windy weather, I cover each pot with a clear plastic bag.

Seeds that are planted outdoors sometimes need protection from birds and other animals. Depending on the location, this might involve covering the pots or flower beds with a sheet of glass or screen wire.

Stratifying Seeds Indoors

If Old Man Winter has already arrived in your area, you can still stratify your seeds. Do it indoors in the refrigerator. Using this approach, you can completely control conditions and give each type of seed the exact amount of chilling it needs.

I've found that using the refrigerator is easy and simple. These seeds require no further attention until their chilling period is complete.

If only a few seeds need treating, you can plant them in pots, which are then stored in the refrigerator. In my case, this isn't practical. To save space in my refrigerator, I stratify my seeds in plastic bags. Here's how I do it.

I start with a new, zip-lock storage bag for each kind of seed. When stratifying seeds, I prefer to use soilless potting mix. However, sand, peat moss, or sphagnum moss can also be used. Whatever potting media you choose, be sure to add enough water so it will be thoroughly moistened.

I use one part seeds to three parts moist potting mix. In essence, I create a sandwich in which the seeds are placed between the two layers of potting media.

First, I put half of the potting mix in the bottom of the bag. Large seeds, such as dogwoods, can be set directly on the potting soil. For very small seeds, I use a different approach to prevent them from getting lost in the potting mix. I spread these on a piece of cheesecloth, which I fold up and place on the first layer of potting soil. Then, I cover the seeds or cheesecloth with the top layer of potting mix.

Finally, I seal and label the bag with the date and name of the seed. This is stored in an undisturbed corner of the refrigerator. Most folks will also want to label this bag "DO NOT EAT" for the benefit of others in the household.

When stratifying seeds in the refrigerator, freezing temperatures are unnecessary. Somewhere between 34 and 42 degrees Fahrenheit is considered optimal.

During the Spring after the cold treatment is over, I remove the bags from the refrigerator, and plant the chilled seeds.

If known, the exact stratification period is given below for each kind of plant along with its status as a bee plant.

HERBACEOUS BEE PLANTS

Anemone or windflower (*Anemone spp.*) Spring flowering bulbs, pollen plants:

These seeds will need chilled for three weeks.

Fall blooming asters (*Aster sop.*) perennials, nectar and pollen plants

Chill these seeds for two weeks.

Begonia, pig squeak (*Begonia sop.*) perennial, pollen plants

Begonia seeds require two weeks of chilly temperatures. When chilling them outdoors, plant the seeds on the soil surface. Don't cover deeply.

Showy black-eyed Susan or coneflower (*Rebecca fluidal*) perennial, nectar and pollen plant

Seeds of the showy black-eyed Susan need chilled for two to four weeks. If you're chilling these outdoors, sow the seeds on the surface.

Christmas rose, Lenten rose (*Helleborus spp.*) perennials, nectar and pollen plants

Black-eyed Susan.

For best results, chill these seeds for three weeks.

Clematis (*Clematis spp.*) vines and herbaceous perennials, nectar and pollen plants

Depending on the species, the chill requirement for clematis seeds ranges from one week to six months.

Flowering sage (*Salvia x superba* and *Salvia patens*) perennials, nectar and pollen plants

These need three weeks of cold temperatures. When chilling outdoors, sow the seeds on the surface.

Fritillary, guinea-hen flowers (*Fritillaria spp.*) hardy bulbs, nectar plants

Chill these seeds for two to three weeks.

Garden phlox (*Phlox paniculata*) perennial, pollen plant

Give these three to four weeks of chilling temperatures.

Gasplant (*Dictamnus albus*) perennial, nectar and pollen plant

Boneset.

These do best if they're sown outdoors in the Fall or early Winter where they are to grow.

Gentian (*Gentiana spp.*) perennials, nectar and pollen plants

These seeds require eight weeks of chilling.

Hardy geranium (*Geranium spp.*) perennials, nectar and pollen plants

Chill these seeds for two to three weeks.

Joe-pye-weed, boneset (*Eupatorium spp.*) perennial wildflowers, nectar plants

These need chilled for about four to six weeks.

Larkspur (*Delphinium spp.*) perennials, nectar plants

These seeds require two weeks of chilling temperatures.

Lavender (*Lavandula spp.*) perennials only, nectar and pollen plants

Though hardy lavender seeds will sometimes sprout without being chilled, they germinate more readily if they are exposed to chilling temperatures for four to six weeks.

Milkweed.

Milkweed (*Asclepias spp.*) perennials, nectar and pollen plants

These require chilling for three weeks.

Ornamental onions (*Allium spp.*) hardy bulbs, nectar and pollen plants

These seeds should be chilled for about four weeks. If chilling outdoors, sow the seeds on the surface.

Purple coneflower (*Echinacea spp.*) perennials, nectar and pollen plants

Though chilling isn't completely essential, germination will be much better if these are chilled for about four weeks. If you're chilling them outdoors, completely cover these to a depth of 1/8 inch. They need darkness in order to germinate.

Saxifrage (*Saxifraga spp.*) perennials, nectar and pollen plants

These seeds need chilled for three to four weeks.

Snapdragon (*Antirrhinum majus*) annuals and perennials, nectar and pollen plants

These benefit from a chilling. Normally, it is best to plant them outdoors during late Fall or early Winter. Sow the seeds on the surface.

Soapwort (*Saponaria spp.*) perennials, pollen plants

For best results, chill these seeds for three to four weeks. If chilling outdoors, sow on the surface. Do not cover them.

Spiderwort (*Tradescantia spp.*) perennials, nectar and pollen plants

This will benefit from chilling for about three months.

Three-toothed cinquefoil (*Potentilla tridentata*) perennials and shrubs, nectar and pollen plant

These seeds require two to four weeks of cold temperatures.

Crabapple.

Thrift (*Armeria spp.*) perennials, nectar and pollen plants

For best results, chill these seeds for about two weeks.

Toadflax (*Linaria spp.*) perennials and annuals, nectar and pollen plants

Toadflax seeds will need chilled for around three weeks.

Verbena (*Verbena spp.*) perennials, nectar and pollen plants

These require two to four weeks of chilly temperatures.

Violets (*Viola spp.*) perennials, nectar plants

Two weeks of chilling is recommended. When planting outdoors, do cover the seeds. These need darkness in order to germinate.

WOODY BEE PLANTS

American beech (*Fagus grandifolia*) tree, pollen plant

Chill these seeds for three months

Birch (*Betula spp.*) trees, pollen plants

For best results, these seeds need chilled for four to eight weeks.

Buckeye (*Aesculus spp*) trees and shrubs, nectar and pollen plants

Provide these seeds with 3½ to four months of chilly temperatures.

Chaste tree (*Vitex spp.*) shrubs, nectar plants

For best results, plant the seeds outdoors during late Fall or early Winter.

Chestnut (*Castanea spp.*) trees, nectar and pollen plants

These seeds should be planted outdoors before the ground freezes.

Crab apple (*Malus spp.*) trees, nectar and pollen plants

Because the amount of chilling varies from one species to another, the easiest approach is to plant the seeds outdoors in the late Fall or Winter.

Dogwood (*Cornus spp.*) trees and shrubs, nectar and pollen plants

The chilling time for dogwoods depends upon the species. For best results, just plant the seeds outdoors during late Fall or early Winter.

Evodia, bee-bee tree (*Tetradium daniellii*) tree, nectar and pollen plant

The exact length of the chilling period isn't known. So, just plant the seeds outdoors in the Fall or early Winter for best results. Direct sow where they are to grow. These seedlings have long tap roots, and don't do well in containers.

Flowering quince (*Chaenomeles spp.*) shrub, nectar and pollen plants

Chill these seeds for two to 2½ months.

Honeysuckle (*Lonicera spp.*) shrubs and vines, nectar and pollen plants

Specific recommendations aren't available for this seed. For best results, plant outdoors in the fall or early winter.

Hornbeam (*Carpinus spp.*) trees, pollen plants and sources of honeydew

For best results, collect the seeds when they still slightly green, and chill them outdoors for two to six months.

Lilac (*Syringa spp.*) shrubs, pollen plants

These will germinate better if they're chilled for one to three months.

Magnolia (*Magnolia spp.*) trees and shrubs, pollen plants

Chill these seeds for three to four months.

Maples (*Acer spp.*) trees and shrubs, nectar and pollen plants

With the exception of red maple and silver maple, these seeds need chilling. While those of the big tooth maple only needs 30 days, the others require three months or so.

St. Johns wort (*Hypericum spp.*) shrubby perennials and shrubs, pollen plants

Since no definite period is available, plant the seed outdoors in the late Fall or early Winter.

Serviceberry (*Amelanchier spp.*) trees, pollen plants

The chilling requirement does vary by species. For best results, plant them outdoors during the late Fall or early Winter.

Species roses (*Rosa spp.*) shrubs, pollen plants

These seeds need chilled for three months or so.

Viburnum (*Viburnum spp.*) shrubs and trees, nectar and pollen plants

Seeds of the Northern species require chilling. Plant the seeds outdoors in the Fall as soon as they're ripe. BC

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

Telling The Bees

Dick Marron

"Someone has to tell the bees, the beekeeper has died."

I never met the man and I am least connected to the story. It really began in Czechoslovakia where he was born but I'll never know about that. I came into the picture when I got a call from a friend.

"Guess what? How would you like to pick up some bees?"

Though we had done swarms together, this was not the season. In fact I had just taken advantage of a day when it was not quite raining, to give my bees a last feeding and tuck them in for the Winter. The "season" was over.

"This woman called me and wants to get two hives off the property. They are her fathers but he's seriously ill."

We emptied out the van keeping the few tools we'd need. We set off early Sunday morning in a spirit of adventure. It was hard not to be enthused about a windfall of bees. We talked a little more on the way.

"He's in the hospital and he will never come home. She's certain."

The bees were in the city. As we followed our directions through the grey morning the mood became somber. I was surprised to find bees on the deck of an upstairs apartment in close quarters with other apartments. He must have really wanted bees, to keep them here. It was too cool for them to fly; it was easy to screen them in. We started with the other work.

It turned out there was one hive with enough extra equipment for several more. We cherry-picked our way through it. It was not a fit day to check the bees for disease but the idea of disease was in our mind. We made a pile of the drawn comb, opting not to use it on those grounds. I reflected that it was nearly a season's work for a new hive to just draw comb and survive the Winter. I knew it had real value for the owner ... but not to us.

Much of the equipment was homemade. I could see the care that went into it. The bottom boards were unique; he had thought about them. He did things differently than I do. His use of all shallow supers, even for brood chambers was interesting. There was a personal stamp to all of this.

New stuff, still in boxes, bore witness to his ongoing plans for the future. This was something we had in common. There's always "next year," for a beekeeper. We gave her what we thought was a fair price. Could any price be fair?

His daughter talked about him, sometimes tearfully.

"I'd see him just sitting on the porch and I'd ask him what he was doing. He'd say, 'just watching my bees.'"

She didn't understand this but I did. Most of what they do is enter and leave but we all love to watch them. My father would have understood, as well. He had a birdfeeder in the yard, where I have a beehive. His last words from his hospital bed were, "I just want to go home and watch the birds."

Today I feel like I'm mourning for a man I never met. Maybe I'm that noble but I also know the bell tolls for me. Who will take my bees? Will they value them?

My somewhat maudlin emotions embarrass me sometimes. I had to keep my face turned away when I heard my friend telling the daughter about a tradition. The phrase has been rattling around in my head ever since. I'm trying to write it away.

"Someone has to tell the bees; the beekeeper has died."

A Bit Of History . . .

About "telling the bees" when someone has died. Since I didn't think that talking to bees was that unusual, it made sense to me that they should be informed. It did, however, make me curious as to how old this tradition was. I began an investigation. If you pray to St. Google using the words "Telling the Bees," over a thousand responses will befuddle you. There are many poems, a couple of books; a number of short stories a few engravings and at least one rather famous painting. The more I looked, the more I found. The more I found about "telling," the more I found about other superstitions. I have included just a few excerpts. The assignment of spiritual powers to the bees started a long time ago. It then spread far and wide. I'll let you find the most well known: "Telling The Bees", by John Greenleaf Whittier. www.web books.com/classics/poetry/anthology/Whittier/Telling.htm

In Greek mythology, at one time Kronos was the chief god. He had been warned that one of his children would slay him. Being no fool, he proceeded in what must be the apex of tough love, to eat his children as they were born. After about the fourth time this happened, his wife, also no fool, chose to do something about it. She took the next child, a male, and hid him in a cave. Titans were left to guard him. Nymphs were there to care for the babe. The bees were there to feed him on honey. Since these stories are based mainly on gossip, they vary a little. Some say the bees morphed into the nymphs. If you'll

remember, a nymph is a stage of insect development. Coincidence? I don't think so!

When the baby cried, the guards would clash their armor so that old Kronos wouldn't hear him. I can't help but connect this with the custom of later folks banging pots and pans to call the bees. In any case, the plan worked. The child grew up to be Zeus. He put an end to the disgusting eating habits of old Kronos and became the big cheese god himself. The bees found their place in history. Caves in the mountains were thought to be entrances to the underworld. Since bees lived in those caves they got the reputation of being messengers to that world. It didn't hurt their status at all that they had nurtured a god.

Naiads and ye pastures cold,
When the bees return with spring,
Tell them that Leucippus old
Perished in his hare-hunting,
Perished on a winter night.

Now no more shall he delight
In the hives he used to tend,
But the valley and the height
Mourn a neighbor and a friend.
Anonymous

Telling the bees about all the goings on in a family became an important ritual. There were likely to be consequences if one did not do so. I found the following.

"The theory that when the bees in a farmer's hives die, he will soon be compelled to move from the farm, is easily accounted for by Mr. Gibson:" "A hive of bees rarely dies unless the season is so bad that it is disastrous to farming; consequently, where a farmer holds his farm on a yearly tenancy, it may follow that he will find it necessary to go elsewhere to build up his fortune."

Full communication with bees was important. This is portrayed in the poem "The Bee-Boys Song" by Rudyard Kipling: www.poems-and-poetry.com/rudyard-kipling/the-bee-boys-song-poem.html for the entire poem.

Marriage, birth or buryin'
News across the seas,
All your sad or merryin'
You must tell the bees.

As soon as it is gotten, news must be told. The following is from World War One.

TELLING THE BEES
(An old Gloucestershire superstition)
G. E. R. IN The Westminster Gazette

They dug no grave for our soldier lad, who fought and who died out there:
Bugle and drum for him were dumb, and the padre said no prayer;
The passing bell gave never a peal to warn that a soul was fled,
And we laid him not in the quiet spot where cluster his kin that are dead.
But I hear a foot on the pathway, above the low hum of the hive,
That at edge of dark, with the song of the lark, tells that the world is alive:
The master starts on his errand, his tread is heavy and slow,
Yet he cannot choose but tell the news – the bees have a right to know.
Bound by the ties of a happier day, they are one with us now in our worst;
On the very morn that my boy was born they were told the tidings the first:
With what pride they will hear of the end he made, and the ordeal that he trod
Of he scream of shell, and the venom of hell, and the flame of the sword of God.
Wise little heralds, tell of my boy; in your golden tabard coats
Tell the bank where he slept, and the stream he leapt, where the spangled lily floats:
The tree he climbed shall lift her head, and the torrent he swam shall thrill,
And the tempest that bore his shouts before shall cry his message still.

On many Yorkshire farms it was, and perhaps still is, the custom to tell the bees when a death had taken place in the family. The hive had to be put into mourning, and when the arval, or funeral feast, was held, after the return from the grave, small portions of everything eaten or drunk had to be given to the bees in a saucer. Failure to do this meant either the death or departure of the bees.

Whisht! *laatle bees, sad tidings I bear,*
Bees, bees, murmurin' low ;
Cauld i' his grave ***ligs*** *your maister dear,*
Bees, bees, murmurin' low.
Nea mair he'll ride to t' soond o' t' horn,
Nea mair he'll ***fettle*** *his sickle for t' corn.*
Nea mair he'll coom to your ***skep*** *of a morn,*
Bees, bees, murmurin' low.

Muther sits cryin' i' t' ***ingle nook,***
Bees, bees, murmurin' low ;
Parson's ***anent*** *her wi' t' Holy Book,*
Bees, bees, murmurin' low.
T' mourners are coom, an' t' ***arval*** *is spread,*
Cakes fresh frae t' ***yoon,*** *an' fine* ***haver-bread.***
But ***toom'*** *is t' seat at t' table-head,*
Bees, bees, murmurin' low.

Look, ***conny*** *bees, I's winndin' black crape,*
Bees, bees, murmurin' low ;
Slowly an' sadly your ***skep*** *I* ***mun*** *drape,*
Bees, bees, murmurin' low.
Else you will sicken an' ***dwine*** *reet away,*
Heart-brokken bees, now your maister is clay ;
Or, mebbe, you'l leave us wi' t' dawn o' t' day,
Bees, bees, murmurin' low.

Sitha! *I bring you your share o' our feast,*
Bees, bees, murmurin' low;
Cakes an' ***yal*** *an' wine you* ***mun*** *taste,*
Bees, bees, murmurin' low.
Gie some to t' queen on her gowlden throne,
There's ***foison*** *to feed both worker an' drone ;*
Oh ! dean't let us fend for oursels alone
Bees, bees, murmurin' low.

Someone found the following in the "Argus," a London newspaper, Sept. 13, 1790; "A superstitious custom prevails at every funeral in Devonshire, of turning round the bee-hives that belonged to the deceased, if he had any, and that at the moment the corpse is carrying out of the house."

Elsewhere it is stated that the hives should be "heaved." That is, they should be lifted at the same moment the coffin is lifted.

In Molle's Living Libraries (1621) we read: "Who would beleeve without superstition (if experience did not make it credible), that most commonly all the bees die in their hives, if the master or mistresse of the house chance to die, except the hives be presently removed into some other place? And yet I know this hath hapned to folke no way stained with superstition."

Sometimes the bees were told so quickly that the perception that they were being told was the first inclination one had that there had been a death. The classic Whittier poem tells the story of a lover returning after an absence to find the hives dressed with black crepe. As he gets nearer he unhappily hears the name of his beloved being crooned to the bees. The poem below is on the same theme, but earlier.

Bathsheba
By Lizette Woodworth Reese
Bathsheba came out to sun
Out to our walled cherry trees;
The tears down her cheek did run,
Bathsheba standing in the sun,
Telling the bees.

My mother had that moment died,
Unknowing, sped I to the trees,
And plucked Bathsheba's hand aside;
Then caught the name that there she cried
Telling the bees.

Her look I never can forget,
I that held sobbing to her knees;
The cherry boughs above us met;
I think I see Bathsheba yet
Telling the bees.

In these ancient times it was thought that the bees were messengers to the underworld and that they would carry the message that a soul was joining them.

This is the final verse of a poem by Eugene Field. (1850/1895)

Telling the Bees
O gentle bees, I have come to say
That grandfather fell asleep to-day,
And we know by the smile on grandfather's face
He has found his dear one's biding-place.
So, bees, sing soft, and, bees, sing low,
As over the honey-fields you sweep
To the trees abloom and the flowers ablow
Sing of grandfather fast asleep;
And ever beneath these orchard trees
Find cheer and shelter, gentle bees

The same source tells of the custom in Germany:

The pathetic custom of "telling the bees" when the master or mistress of a house dies, is not unknown in our own country. In Berlin, Germany, the idea is more fully worked out; and not only is the sad message given to every beehive in the garden, and every beast in the stall, but every sack of corn must be touched and everything in the house shaken, that they may know the master is gone. (Tylor, Primitive Culture, I 286-7)

This is all superstition, Right? I agree, but there is a sort of comfort in talking to a pet. If the bees would stand for It, some of us would pet them. We are less alone when we give an animal the likelihood of magical power. Anyway, I've taken up the habit of telling them that I'm still O.K. They know I've got some mileage on me and when I stay away for more than a week, I don't want them to get the wrong idea. BC

Dick Marron is a retired psychologist, living in a beeyard in Ct.

Letters From A Beekeeper's Wife

Mary

The I.P.T.A. Fund

Back in 1917, *Gleanings* published a series of "Letters from a Beekeepers Wife." These letters were written by "Mary," a pseudonym for nobody-knows-who, to her sister. Each month another letter was printed to offer lessons and observations in a charming, light-handed manner. Time has only added to their quaintness. But time has also lent an air of: Good Grief, people, 90 years later, and we are still saying the same stuff. Maybe you guys ought to Listen Up. Now, you newbie's, I'm not talking to you. This is a friendly little story, for you. But you old timers, you guys who are stubborn, bull-headed, don't need to learn a thing because you already know it all... Anon.

Home, January 1, 1917

Dear Sis;

The Christmas box that came the day before Christmas from your house could not have been more enjoyed. Billie has been out on his skates every day since, and the girls are delighted with their muffs. They have always wanted furs but we thought we couldn't afford them. Now that they have muffs we are going to take the money out of our private I.P.T.A. fund and get them neck pieces to match. (Now before any PETA people get all fired up, let me remind you this was written 90 years ago.)

Have I ever told you about the I.P.T.A. fund? It stands for "It Pays To Advertise" - and it certainly does. We never realized how much it pays until our road became part of the Jefferson Highway. A year ago last autumn, just after the concrete road was laid, we found that we had considerable Fall honey which was very good but it was what the buyers call "off color." Rob conceived the idea one day as we sat watching the autos whiz past that we might be able to sell that honey to passersby. That is an undeveloped trade, so if we can sell to them it means just that much more honey disposed of.

He talked about it all Winter off and on, but, man-like, never did anything until Spring. One day he painted a big sign, "HONEY FOR SALE," and nailed it to a post at the gate at the east end of the lot. It wasn't a sign painter's job, and may be that convinces the city folks that we have "bee honey." Mother was here at the time and may be she told you how scandalized she was by that sign! I don't see just why she thought it so much worse to sell honey at our door than to send it away to be sold, but in her mind it "lowered" us in the social scale to have the sign up. I don't take much stock in social scales. They are never balanced, are they? So I was just as eager as Rob to see what would happen. I had a little honey in quart Mason jars - not the green ones, of course - all ready and had previously ordered some plain labels. I don't believe it was more than an hour after that sign went up before an auto stopped and a man came up to the door. To be sure, he didn't

buy - he wanted comb honey - but he was interested and even went out to look at the hives. The next day another auto stopped at the sign - a Ford this time - and those people took a quart of honey. It's queer, but we seem to sell more to Fords, perhaps because they can stop more easily. We put the 65 cents ($11.02 today) in a Mason jar and Mother assured us that we'd never have any more to put in from that source, but we felt elated. If only one person a day was halted by the sign and bought one quart of honey we would be getting 20 cents a pound (that's $3.39 today) for that much honey instead of seven or eight. There's a big difference between wholesale and retail prices. (OK, do we want to pause a minute and reflect on that 65 cent windfall this lady was celebrating?)

Well, do you know that scarcely a day passed after that but some one stopped to buy? And as the warm weather came on, bringing tourists by the score, we could scarcely keep up with the demand. That's why I have so little canning done for this Winter. We actually had to buy more honey to sell to our auto trade, which makes Rob sore when he remembers that

most of our crop last year was sold at wholesale.

We noticed that machines coming from the east stopped frequently but that those going the other way got too far past before they could slow down, and we usually lost their trade, so Rob put another sign at the west end of the lot to "catch them coming and going." It's tremendously interesting to watch the machines come flying by - then come to a halt. There's a little conversation, some hesitation, then (particularly if there are children aboard) some one is almost sure to get out and walk up the line of basswoods. Our Mason jar bank was outgrown long ago - on Labor Day we took on $35 ($593 today). With this weather of course auto traffic is at its lowest ebb, and yet I dare not have less than a half dozen jars ready on the shelf. There are so many calls for comb honey that we will buy some next Summer to have on hand. Rob says he can buy that cheaper that he can produce it, but may be that's true of the extracted too, for selling honey is more profitable than producing it.

The nicest part of all is that so many come back for more. Rob has visions of some day selling all of his own honey and more besides, from his own doorstep. Wouldn't it be fine if he could? Mother is convinced now that it pays to advertise and has even got over the feeling that "it isn't done by the best families." So we have accomplished more than all the profit by widening her horizons a little.

I forgot to tell you that Rob has promised to take me to the state convention later this month - the beekeeper's convention of course. I'll tell you all about it later. I'm curious about it.

Your loving sister, Mary

So, now what did that teach us, hmmm? You folks that are sitting in the middle of a mountain of five gallon buckets you figure maybe you can sell at bulk prices to another beekeeper who will bottle it and sell it at premium prices with his own label on it? You know who you are. Bottle some of that honey up, put a sign out front and make a little money. What are you waiting for? Take it to a farm market, the corner store, a gas station, for crying out loud. Make a deal with the local Greasy Spoon or Bakery: give them some in exchange for setting up a honey display. The opportunities are just out there waiting to be discovered. Just remember:

The codfish lays 10,000 eggs, the homely hen lays one.
The codfish never cackles to tell you what she's done.
And so we scorn the codfish, while the humble hen we prize,
Which only goes to show you that it pays to advertise.

GLEANINGS

JANUARY, 2007 • ALL THE NEWS THAT FITS

FOUNDATION WORKSHOP RESULTS IN JOINT LAB PROJECT

A Research Workshop hosted by the Foundation for the Preservation of Honey Bees has resulted in a cooperative research project involving all four USDA Agricultural Research Service beekeeping laboratories.

The project, which began in early November, will examine the role of diet and bee type (stock) on overwintering and Spring buildup of honey bee colonies in CA in advance of almond pollination in February and March. The researchers will also monitor queens, viruses, diseases, and pests.

Following the Workshop, which was in mid-August at the University of NE, the research leaders at the bee labs – Beltsville, Baton Rouge, Weslaco, and Tucson – appealed to ARS Administrator Dr. Ed Knipling, who committed $76,000 from discretionary funds to the project.

The Research Workshop brought together beekeepers who are knowledgeable about the extraordinary colony losses the industry has experienced over the past couple of years and the USDA-ARS researchers. The idea was that the researchers would be able to glean information from the beekeepers' reports that would help them focus their research on areas that could be useful to solving this dilemma.

The workshop participants brainstormed 23 areas needing research, the top three being Chemical and Genetic Control of Bee Diseases and Pests/Parasites; Queen Problems; and Nutrition. Possible research projects were identified for each of the three top areas.

Going around the room expressing their initial views, the participants made a variety of points, including –

"More erratic weather conditions adversely affecting beekeeping."

"Beekeeping has changed; beekeepers are falling behind."

"All the chemicals we use are lethal to bees in strong enough concentrations."

"Are we ignoring tracheal mites and their contribution to the problem?"

"Beekeepers need at least three products (chemicals) to be able to manage resistance."

"Beekeeping is such a small market that it is difficult to attract manufacturers [of miticides]."

"What should we focus on – a long-term home run? Or short quick successes"?

"There are fewer than 10 'honey bee programs' at universities. State beekeeper associations need to lobby legislators for state university programs."

Participants at the Research Workshops were:

- Marion Ellis, University of NE, vice chairman of the Foundation Board of Trustees and representing university bee researchers.
- Jeff Pettis, Beltsville Bee Lab.
- Tom Rinderer and Bob Danka, Baton Rouge Bee Lab.
- John Adamczyk and Frank Eischen, Weslaco Bee Lab.
- Gloria Hoffman, Tucson Bee Lab.
- Richard Adee, Jack Meyer Jr., and Jerry Brown, American Honey Producers Assn.
- David E. Hackenberg, David R. Hackenberg, Jay Miller, Danny Weaver, Zac Browning, George Hansen, and Pat Heitkam, American Beekeeping Federation.
- George Bunnell, NE Honey Producers.
- Manley Bigalk, IA Honey Producers.
- Troy Fore, Foundation executive director.

The Foundation is a 501(c)(3) research and education foundation, meaning it can accept tax deductible donations. To include the Foundation in your giving plans, write Foundation, P.O. Box 1337, Jesup, GA 31598, email: beefoundation@bellsouth.net, or see www.honeybeepreservation.org.

BEEYARD MANAGEMENT FROM AFAR

Bee Alert Technology, Inc. is pleased to announce that they can now provide affordable satellite communications from beeyards for all of North America and most developed countries of the world. The basic system can be used in different modes ranging from GPS tracking of hives, trucks, and load temperatures to beeyard-based monitoring of gates, roadways, motion, bear traps, cameras, and variables such as hive weight and weather. In addition, they've just received trademark approval for their Hive Sentry™ security systems. Call us at 406.541.3160 or e-mail info@becalert.blackfoot.net and let them design the system that best meets your needs. Basic service charges are as low as $5 per month for 20 messages – beeyard to satellite to your phone or computer.

SD CONSIDERING CERTIFICATION FOR HONEY

The South Dakota Department of Agriculture is considering a state certification program for honey, which would allow it to be branded and attract premium prices.

The state ranks among the top five producers in the United States and each year produces up to $16 million worth of honey that is generally light colored and used to improve the quality of dark honey produced elsewhere.

State Agriculture Secretary of Larry Gabriel has raised the idea under his mandate to encourage, protect, and promote, in every practical manner, the interests of agriculture, including horticulture.

"A clean environment should produce the purest honey," he says. "We have some of the cleanest environment in America and produce what might be the best honey."

But Gabriel says the problem is much of this honey is "given" away as a bulk commodity.

"I have been told that some of our honey goes to China where it is blended with their lower quality honey which is then sold back to consumers in America," he says.

South Dakota usually ranks third or fourth in the nation in honey production and North Dakota ranks about the same with each state having about 225,000 bee colonies.

"Between the two Dakotas we normally have more honey in stock at the end of the year than California, Florida and Arizona combined," Gabriel says. "We have enough honey for a regional or state branded product.

OBITUARY

Edward William Lusby, 59, a lifetime resident of Pima County, Arizona, died at home 25 October 2006 in the hills he loved of Moyza, near the towns of Arivaca and Amado, Arizona.

He was born February 26, 1947, in Tucson, Arizona and lived there most of his life. He grew up keeping honey bees with his first visits to the bees about the age of two, and owning his first two beeyards by the time he finished high school. He graduated from Catalina High School in 1965, and after trying college for about a year decided instead to follow the family tradition of beekeeping. He worked on the family farm with his father Ralph and grandfather Bill. Ed was a fourth generation beekeeper.

After meeting Dee, Ed kept increasing the bee colonies he had, until he expanded the bee business to the point where he could support his family doing what he loved under the name Lusby Apiaries DBA: Arizona Rangeland Honey Company, as full time commercial beekeepers, using organic field management, relying on native upper Arizona Sonoran Desert plants rather than cultivated crops for honey, pollen and honeybee nuc production.Together with his wife Dee, they decided to move in 2005 to the hills where their bees were, to be closer to the bees he loved.

Edward is survived by his wife of 22 years, Dolores (Dee), daughter and son by previous marriage, Michelle Wortman, Edward J. Lusby; father and step-mother, Ralph and Ruby Lusby; sister, JoAnne Gerry; two younger brothers, Curtis and Ralph; four grandchildren, David Scott, Angelica, Rebecca, Eric Thomas.

NATIONAL HONEY BOARD™

New Members Sought The National Honey Board Nominations Committee (NHNC) is seeking new members from: Arizona, Arkansas, Idaho, Indiana, Montana, New Jersey, North Dakota, Pennsylvania, Vermont and Washington. The following states have a member who may serve one more term, but need to submit two choices to the Secretary of Agriculture: Florida, Hawaii, Iowa, Kentucky, Massachusetts, Mississippi, Nebraska, New Mexico, North Carolina, South Dakota, and Wyoming.

The National Honey Nominations Committee consists of one member from each state. Committee members are individuals involved in the honey industry. Each state association submits names of two potential NHNC members to the Department of Agriculture. The Secretary of Agriculture then appoints one of the candidates to be that state's Nominations Committee representative.

NHNC nominates the members and alternates of the National Honey Board (NHB) and submits the nominations to the Secretary of Agriculture for approval. The Secretary makes the final NHB board member selections. NHNC members attend one meeting per year, coinciding with the NHB's annual Fall meeting. NHB covers the expenses of NHNC members.

NHB strongly encourages women, minorities, and persons with disabilities to seek nominations to NHB and NHNC, and to participate in Board and Committee activities.

Individuals interested in serving on NHNC should speak to their state association president.

Honey Industry Members Nominated To Serve On NHB The National Honey Board Nominations Committee nominated members and alternates to the National Honey Board in Houston, TX, September 30. The nominees, who must be approved by the Secretary of Ag, replace current board members whose terms expire in 2007.

Region 1 Producer
Board Member George Hansen, Colton, OR; 1st Alternate Glenda Wooten, Palo Cedro, CA; 2nd Alternate Bob Miller; Watsonville, CA

Region 2 Producer
Board Member Jim Rodenberg, Wolf Point, MT; 1st Alternate Jerry Brown, Haddam, KS; 2nd Alternate Diane Rudebusch, Randolph, NE; 3rd Alternate Mark Jensen, Power, MT

Region 3 Producer:
Board Member Zac Browning, Jamestown, ND; 1st Alternate Joan Gunter, Towner, ND; 2nd Alternate Larry Bermel, Java, SD; 3rd Alternate Bonnie Woodworth, Halliday, ND

Handler 2
Board Member Nancy Gamber-Olcott, Lancaster, PA; 1st Alternate Steve Smith, Victorville, CA

Officers elected were Nominations Committee Chairman David Ellingson of Ortonville, MN, and Vice Chair Peggy Miller of Crowheart, WY.

NHB conducts research, advertising and promotion programs to maintain and expand domestic and foreign markets for honey. Programs are funded by an assessment of one cent per pound on domestic and imported honey.

PERIODICALS

RURAL HERITAGE – bi-monthly magazine in support of farming and logging with horses, mules, and oxen. Subscription includes THE EVENER Workhorse, Mule & Oxen Directory; $29 for 6 issues; sample $8.00. Rural Heritage, 281-B Dean Ridge Lane, Gainesboro, TN 38562. 931.268.0655, www.ruralheritage.com

THE SCOTTISH BEEKEEPER. Magazine of The Scottish Beekeepers' Assoc. Rates from Enid Brown, Milton House, Main Street, Scotlandwell, Kinross-Shire KY13 9JA, Scotland, U.K. Sample on request. $1.

IBRA: INFORMATION AT YOUR FINGERTIPS. IBRA is *the* information service for beekeepers, extension workers and scientists. Our members support this service and enjoy the benefits of belonging to IBRA, which includes *The Journal of Apicultural Research incorporating Bee World.* We need your involvement - join IBRA - support this important information network and extend your beekeeping horizons. For more information contact: IBRA, 18 North Road, Cardiff CF10 3DT, UK. Telephone (+44) 29 2037 2409. Fax (+44) 29 2066 5522; mail@ibra.org.uk.

THE AMERICAN BEEKEEPING FEDERATION has many benefits to offer its members. Send for a membership packet of information today! Contact the American Beekeeping Federation, P.O. Box 1038, Jesup, GA 31598, ph. (912) 427-4233, fax (912) 427-8447 or email info@abfnet.org.

IRISH BEEKEEPING. Read An Beachaire (The Irish Beekeeper) Published monthly. Subscription $22.00/year, post free. Mr. Graham Hall, "Weston", 38 Elton Pk., Sandycove, Co. Dublin, Eire, email: Graham Hall@dtti.team400.ie.

THE AUSTRALASIAN BEEKEEPER. Published monthly by Pender Beegoods Pty. Ltd. Send request to: The Australasian Beekeeper, 34 Racecourse Road, RutherfordNSW 2320, Australia. Sub. $US 38 per annum, Surface Mail (in advance). Payment by Bank Draft. Sample free on request.

Bee interested. For beekeeping information read the AMER. BEE JOUR. New editorial emphasis on practical down-to-earth material, including question & answer section. For information or free copy, write to: AMERICAN BEE JOUR., Hamilton, IL 62341.

THE AUSTRALIAN BEE JOUR. Monthly, Annual subscription outside Australia, sent by airmail, $100 Australian. Write to: Victorian Apiarists' Association Inc., Annette Engstrom & Lauren Mitchell, 6 High St., Eaglehawk, Victoria 3556, Australia. Sample on request. Email: abjeditors@yahoo.com.

THE NEW ZEALAND BEEKEEPER. National Beekeeper's Association of NZ. Write for rates & indicate whether airmail or surface. NZ BEEKEEPER, P.O. Box 447, Hamilton, NZ.

BEES FOR DEVELOPMENT. Information for beekeepers in remote areas. Sponsor a subscription. $35, quarterly journal. Troy. Monmouth, NP254AB, UK. info@beesfordevelopment.org

HIVELIGHTS, published by The Canadian Honey Council. Write Suite 236, 239-5149 Country Hills Blvd. NW, Calgary, AB T3A 5K8

THE BEEKEEPERS QUARTERLY is published by Northern Bee Books, Scout Bottom Farm, Mytholmroyd, Hebden Bridge, West Yorks HX7 5JS. Write or email jeremy@recordermail.demon.co.uk for a sample copy.

MANITOBA BEEKEEPER is published quarterly by the Manitobab Beekeepers' Association. Write for a sample copy to Lois Simpson, Lot 19, Kingsway Kort, RR #1, Brandon, MB R7A 5Y1.

HONEY BEE SCIENCE is a Japanese Science and Research Journal. For information contact Japan Publication Trading Co. Ltd., P.O. Box 5030, Tokyo Internationalk, Tokyo, Japan.

MELLIFERA is published twice a year by the Development Foundation of Turkey. An annual subscription is $US 20. Write to TÜRKIYE KALKINMA VAKFI, Çetin Emeç Bulvan, 7. Cadde No: 39, Öveçler, 60460 Ankara, TURKEY.

BEEKEEPING published by Devon Beekeepers' Association. Memberships rates outside Europe are £21. Send to Brian Gant, Leat Orchard, Grange Rd., Buckfast, Devon TQ11 0EH.

ALBERTA BEE NEWS is published monthly by The Alberta Beekeepers Association, serving the interests of the beekeepers since 1933. A subscription is $35/year. Sample free upon request. Send to The Alberta Beekeepers Association, 11434 - 168 Street, #102, Edmonton, Alberta, Canada T5M 3T9.

BEECRAFT: A full color monthly beekeeping magazine for beginners and experts alike covering all aspects of beekeeping in Great Britain and Ireland. FREE SAMPLE COPY on request. £40 for 12 issues including airmail postage. Credit cards accepted. Contact Bee Craft Ltd., 107 Church Street, Werrington, Peterborough, PE4 6QF. Email: secretary@bee-craft.com Web: www.bee-craft.com; Tel/Fax +44 1733 771221.

DAS BIENENMÜTTERCHEN – Contact IBSZ e.V.Geschäftsstell: Karl Henzler, Fatiostrasse 35, CH-4056 Basel.

LA SANTÉ DE L'ABEILLE – Fédération Nationale des Organisations Sanitaires Apicoles Départementales, 41, rue Pernety, 75014 PARIS.

BIRØKTERAN, Norges Birøkterlag, Bergerveien 15, N-1396 Billingstad, NORWAY.

TEKNIK ARICILIK – Türkiye Kalkmma Vakfi, Çetin Emeç Bulvari 8. Cad. No: 14/11, Öveçler 06460 ANKARA.

VIDA APÍCOLA, Montague Editores, C/ Ausiás March, 25, 1°, 08010 Barcelona.

ULUDAG BEE JOURNAL - Uludag Beekeeping Association, published quarterly in Turkish (with English titles and summaries of all articles) and English in all aspects of beekeeping; news, practical beekeeping, research articles. A link between Turkish beekeeping and the world. Gazcular Cad. No. 9/2 16220 Bursa-TURKEY. Tel & Fax: +90 224 224 3964, http://www.uludagaricilik.org.

BOTTOM ... Cont. From Page 64

I don't have my veil, but naturally I do what he tells me. Looking up, I see a pancake-sized piece of bee-covered honeycomb 24 inches in front of my face. One of the little darlings bounces off my eye socket.

"These are all that are left," he says. "How are they going to make any honey?"

I shake my head. He says, "Do you think there's a queen in there?"

"Maybe," I say.

Back in Batopilas, Senora Monse asks me if I will be staying another night.

"No," I say.

"Well, where are you going?" she asks.

"To the Casa Juanita," I say.

Her eyes shoot daggers. "What happened last night?" she demands.

"It's the scorpions," I say.

She says, "You saw a scorpion?"

"More than one," I say.

Senora Monse looks to her frail and ancient husband. "Our guest reports that he saw a scorpion," she says.

The old man acts genuinely surprised. "A scorpion? We never had one before," he says.

Display Advertisers

The village of Batopilas lies at the bottom of northern Mexico's 6,000-foot-deep, cactus-studded Copper Canyon, where the Mexican timber wolf still howls. Here the principal agricultural business is the business of marijuana. They call it "la mota."

It's late October, but in sub-tropical Batopilas at 1500 feet, it's hot, and the streets are a riot of strange flowers.

I don't see honey bees on the flowers. Butterflies appear to be the main pollinators – orange ones and yellows and grays with long tails.

Bees do hover around food stalls looking for a taste of cut fruit or spilled soda pop. They act like yellow jackets. You never saw anything like it.

To walk into the Casa Monse hotel is to walk into the Garden of Eden. Hammocks swing from lemon trees in the courtyard. Thirteen-year-old Julieta roasts tortillas on an open fire, while a honey bee hovers nearby. Pungent tropical smells – sweet strong essence of damp earth, and of life, and death – envelop you.

The Casa Monse is not a first-class hotel. When I walk in for the first time, I have a touch of fever. Senora Monse greets me like the Prodigal Son. She is even older than I am. "You are Eduardo," she says.

There's something about this woman that I like. Luckily, I speak Mexican. "How would you know that?" I tease. "You must be a witch."

Her dark eyes twinkle as she hooks her arm 'round my waist and leads me to my room. "The Spanish women told me you were coming," she says.

I ask Senora Monse about local beekeepers. "We had one," she says. "He used to come around, but he died."

Faintly delirious, I sleep spread-eagled under a big ceiling fan all through the afternoon.

That evening at the cantina I join Carla and Eva, charming veterinarians from Barcelona. Their lisping, lilting, murmuring Old World Spanish confounds me. They say the Mexicans talk funny. It's a rowdy crowd this Saturday night. A Chihuahua cowpoke sings lonesome cowboy tunes on the guitar. Carla croons "Yesterday" in Catalan. Eva says, "We saw a bee today."

As we linger over Indio beers, the girls confide that the Casa Monse is plagued with scorpions. "You need to pull your bed away from the wall," Eva says. "And look under the covers."

Next door to the Casa Monse, at the newer Hotel Juanita, the proprietress – one Senora Juanita – smiles when I ask about honey bees. She points to her kitchen windowsill littered with dead bees.

"I kill them when they come into my kitchen looking for food," she says. "We have lots of bees."

The actual keeping of bees is apparently dead here. At the old stone hacienda ruins across the river, pigs root in the halls. I knock on the door of a house built on the hacienda grounds. I am searching for a man reported to be a former beekeeper. I am looking for the uncle of Senora Juanita, for Senor Manuel Acaraz.

I hand Senor Acaraz my card. "Ahhhh," he says, "you are the beekeeper who came looking for me yesterday."

Nearly toothless, and advanced in years, Senor Acaraz's eyes light up when he talks about bees. He kept a dozen hives, until African bees invaded these canyons.

"My bees began stinging people across the river," he says. "They harassed the tourists visiting the hacienda. The African comes out fierce, and she won't make honey. Who would want these bees?"

We lean against his pickup truck. Sr. Acaraz is clearly enjoying the conversation, as am I.

"How about European bees?" I ask. "Are there any left?"

"There must be," he says, "because from time to time people bring wild honey from high up in the canyons. They say it comes from gentle bees. Sometimes the colonies are very large."

I wonder if the higher elevations of the canyon – up to 8,000 feet – where it snows and freezes hard, might offer a refuge for non-Africanized bees – a place where their cold-hardiness offers them at least one advantage over the Africans.

That's pure speculation.

At an orchard at 5,500 feet, the farmer and I talk apples, until the conversation inevitably turns to honey bees.

"The African is worthless," he says. "In the Spring I caught a swarm and put it in an apple box, but most of the bees left. Now there's just a little bit of comb on the outside of the box."

"Did you wear a veil to catch the swarm?" I ask.

He smiles. "I don't have one," he says.

I ask if I might take a look.

He'd thrown some plastic over the apple box, "to keep them warm," he says.

He pulls up the plastic and says, "Stick your head under there."

Continued on Page 62

Ed Colby

Copper Canyon

BOTTOM BOARD