

MAY 1999



Bee Culture



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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

MAY 1999 VOLUME 127 NUMBER 5

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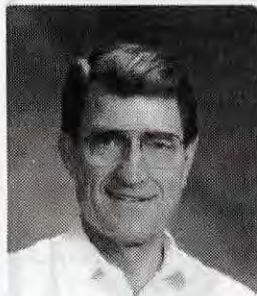
Kim Flottum



COVER

Making successful early Spring splits is an art, a science and necessary for Adees Honey Farms. Find out how they turn 12,000 colonies into nearly 40,000 requeened honey producing machines, starting on page 32.

photo by Kim Flottum



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KIM FLOTTUM
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Bee Culture

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INNER COVER

In early March of this year, authorities in San Diego County, California, during a routine sweep of blooming flowers and weeds in a county park in the town of Fallbrook, captured and subsequently identified an African honey bee. Fallbrook lies almost exactly half way between San Diego and Los Angeles, about 10 miles from the ocean. It is in a primarily rural area, surrounded by avocado and citrus orchards. Also in Fallbrook is Glenn Apiaries, a queen production business owned and operated by Tom and Suki Glenn.

Tom Glenn was a hobby beekeeper in high school. Starting in 1975 he worked for several beekeepers in California to learn the trade, Don Strachen of Strachen Apiaries one of the many. Tom's business, started in 1977 has focused solely on producing queens.

Finding this lone African honey bee does not come as a surprise. Tom and Suki have known for years that the African honey bee would in all probability reach them as it moved through California. But these bees have not moved out of the desert for about four years, and have remained about 50 miles away without moving. Until now.

But Tom and Suki have done their research. They have worked with all the experts on this creature. The Bee Lab scientists from Baton Rouge, who have studied this insect extensively, and Dr. Orley Taylor who has done the same have all told them about the same thing.

"If you want to raise naturally mated queens in an area that is Africanized, you will be able to, with extensive drone saturation. At best, 95% of the drones will be European, and 5% will be Africanized". That is what the published reports say, that is what the research has shown, and that seems to be the answer.

The discussion has always led to the question of "How far away must they be before mixing will occur" And although the experts weren't completely in agreement, a figure of eight miles was understood. The Glenns opted for 10 to be safe, and the park where that single bee was captured was, yes, 10 miles from home.

The Glenn's battle plan has always been based on a simple idea. Do not ship Africanized honey bees. Period. This plan is based on some past data that Tom found very convincing. In 1964, a scientist in Brazil published a paper in *Bee World* telling of the instance where a queen breeder there produced queens in Africanized areas, shipping many thousand of them to various parts of South America. The paper went on to predict that because of this widespread distribution these bees would eventually reach Mexico and then North America, with terrible results. The predictions were pretty much on the mark. Tom also has contacted Dr. Warwick Kerr in Brazil, asking for advice on breeding AHB/EHB hybrids.

So the Glenns decided that when, or if, the bee came to visit, they would shut down their open mated queen business, thus shutting down the possibility of shipping Africanized queens. Even 5% was too great an amount to send, anywhere. The decision was made several years ago, when it was easier to decide to change your life and your life style. Denial is easy when not challenged. And shutting down this part of their business in not an inexpensive decision. Their operation, with no employees, produced about 20,000 queens a year. You can do the math. And, this operation has had a reputation of absolute excellence in service, product and innovative leadership in its short history. Tom was one of the speakers at the queen symposium sponsored by the Federation a couple of years ago. His techniques and dedication to quality control needed to be explored for others to learn from.

"This decision is right for us", Tom told me shortly after the find. "It's important to us that Africanized genes don't get spread more than they will naturally, and that may, or may not include all of the south, and all or most of California. We don't want to hasten the spread.

"However", Tom went on, "That may change. If African bees spread throughout California and the southeast, queens will still need to come from somewhere. And either the queen rearing industry will move away from Africanized areas, or, if there are no Africanized free areas...well, then we'll see what can, and should be done. You can still raise 95%

of your queens free of Africanized genes with a good drone saturation program", he added.

For now, the Glenns have changed from raising production queens and instrumentally inseminated breeder queens, a practice they started over 15 years ago, to just raising instrumentally inseminated queens and nucs. The nucs are for pickup only, while the queens are still being mailed. Time will tell if this will work, and if Africanized bees become the norm rather than a geographic anomaly. The quality of the product certainly won't suffer, and if you have been, or have been thinking of using one of their breeder queens, you are making a good decision.

But there is a bigger picture here, one that needs some attention I think. Over the years beekeepers in many places have been put out of business because of depopulations by regulators due to mites or diseases or whatever. These have been devastating for the businesses involved. And, usually, there has been little choice.

The Glenns have made a choice. One they didn't have to make. One that will drastically affect their livelihood, and to some degree those who depend on the products produced by their work.

For obvious reasons too often in life decisions are made not on what's best, but what's most profitable. My father had a saying about why he was successful in his business. It went like this...

"To be a success, you need to do things right, and you need to do the right things".

For about 20 years Glenn Apiaries have been doing things right. Their success has demonstrated that. This decision, however, is the right thing. For them, for the industry, and for now.

So. For now, keep your hive tool sharp, your smoker lit, and your wits about you, because you just don't know what's out there, and it may be only 10 miles away.



The Right Thing

KEEP IN TOUCH

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Medina, OH 44256
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EMAIL: KIM@AIROOT.COM

MAILBOX

Inherited Behavior?

Richard Taylor is a beloved writer and Bee Talk columnist in *Bee Culture*. Without having met him ever, I appreciate his articles by his particular way of writing. He has become a friend at the other side of the ocean. His monthly chat from beekeeper to beekeeper about bees and beekeepers were and are my favorites. Thanks again and enjoy your life, Richard.

In the January Bee Talk you mention: "Varroa is not a serious problem in Brazil, where virtually all colonies of honey bees are Africanized. I, and many others, assumed that these bees simply attacked the mites physically, in keeping with their notorious fierceness. It now turns out, however, that mite control is primarily through hygienic behavior. That is the bees uncapped brood that is affected with mites and throw it out. Is this behavior inheritable? If so, then this raises the possibility that resistant bees can be bred, and this, surely, is what is needed.

In a recent study (see reference) *A. mellifera* bees in South America, with apparent resistance to *V. jacobsoni*, were transported to France and it appeared that they were as vulnerable to the European *V. jacobsoni* as the local bees. The apparent resistance to *V. jacobsoni* disappeared like snow under a hot sun. "Suggesting that the mites in South America may be less able to reproduce on *A. mellifera* than those in Europe, or that local environmental factors may influence mite reproduction at particular localities."

A DNA test revealed that the South America *V. jacobsoni* reproducing with less fecundity in *A. mellifera* brood was different from the devastating *V. jacobsoni* collected from colonies in Russia, Europe and the United States. My question is whether we have to focus our efforts on the *Varroa* instead of bees to reach a bal-

anced 'live together.'

Sometimes we have colonies showing a kind of resistance to *V. jacobsoni*. Breeding queens from these colonies to retain this resistance? Or, breed this *V. jacobsoni* and spread them to the other colonies. A kind of mutation? More questions than answers, I know, but at last we'll find the real answer.

Ref. Denis L. Anderson, CSIRO Division of Entomology, Canberra, Australia and Stefan Fuchs, Institut für Bienenkunde, Universität Frankfurt, Germany.

"Two Genetically distinct populations of *Varroa jacobsoni* with contrasting reproductive abilities on *Apis mellifera*." *Journal of Apicultural Research* 37(2): 69-78 (1998).

Ko Zoet
The Netherlands

Bee Botany

I noted from one of the letters that a reader desired to know more about honey and nectar plants and the biological processes involved in nectar gathering and pollination. Of course there are, as you suggested, several sources of information in the major bee publications and certainly on pollination of crop plants by MacGregor. Some beekeepers do not possess these publications or desire more comprehensive information on the subjects.

Bee botany is about the only subject of concern to many beekeepers that is not covered by a current, specific publication. I don't think we need any more books published on queen rearing, beginning beekeeping or bee diseases and pests.

Perhaps one reason we have had no publications on the subject of bee botany is that no entomologists or professional apiculturists are interested in technical botany or are not sufficiently competent in the subject. Professional botanists are unlikely to take on

such a project as the work involved would not be sufficiently rewarding. Dr. Lovell was an exception, his work was of a bygone era when it seems accomplishments took precedence over personal gain. Pellett was also an exception, with the ability of a professional but without the degrees, not uncommon among men of talent during those early days.

Today, perhaps, the technical task of such work, is less daunting than securing information relating to field conditions. From experience I have learned that correspondents knowledgeable on the subject of plants/honey production are either rare or uncommunicative. Few authors could afford the time, effort and expense to privately research the subject, even though interested.

Articles in the bee journals on individual plants are often species specific, very good as such but do not reflect current conditions relative to agricultural crop and forage and wild plants that contribute nectar and pollen. Constantly changing demographics cause discrepancies between what we may think and actual conditions.

Larry Goltz
Redding, CA

Doing The Right Thing

We at Glenn Apiaries have decided to discontinue selling naturally mated queens for the rest of this year. It is apparent that the Africanized Honey Bee is advancing in San Diego county this spring. A recent find of AHB 10 miles from our mating area has caused us to come to this decision. Even though we have no evidence of any crossing, we think it is prudent to stop raising naturally mated queens before there is a problem. In order to avoid the risk of mismating, and therefore spreading AHB, we are now raising only artificially inseminated queens. Artificial insemination allows us to have complete

Continued on Page 10

MAILBOX

control over the mating of the bees.

On the bright side, we will be able to focus more of our attention on applying recent advances in bee genetics to help solve some of the serious pest problems facing beekeepers. We will continue to provide artificially inseminated breeder queens as well A1 queens for the backyard beekeeper.

We have enjoyed providing naturally mated queens for the last 22 years. We look forward to continuing serving the beekeeping community by providing disease resistant stock.

Tom & Suki Glenn
Glenn Apiaries

Finest In America

In February I attended the Designer Craftsmen Show in Philadelphia. Advertised as "Simply the finest in American Craftsmanship today," I found it to be just that.

One of the artisans was showing several truly magnificent bee skeps. Both the materials and the design were classic. For anyone interested, you might want to contact the following: Lisa B. Head, R.R. 1, Box 154A, Loysville, PA 17045.

David G. Smith
Church Hill, MD

Hindsight

As per the recommendations in your November 1998 issue, I didn't use either hive wrap or entrance reducers last winter. Yesterday, April 4, was finally warm enough to have a look in the hives, and what I found was disheartening. All three of my hives had had the foundation in the lower hive body destroyed by mice, and two of the three colonies are currently dead. By applying money I expect to resurrect them, but I had high hopes for them in the coming season. So much for raising queens this year. It may well be that ventilation is more important to hive health

than insulation, but at least in southern Vermont keeping varmints out is (or at least, should have been) a priority. Still, I will not be deterred; bees are on order, and I have hardware cloth in the basement.

Chris Lumley
Tutney, VT

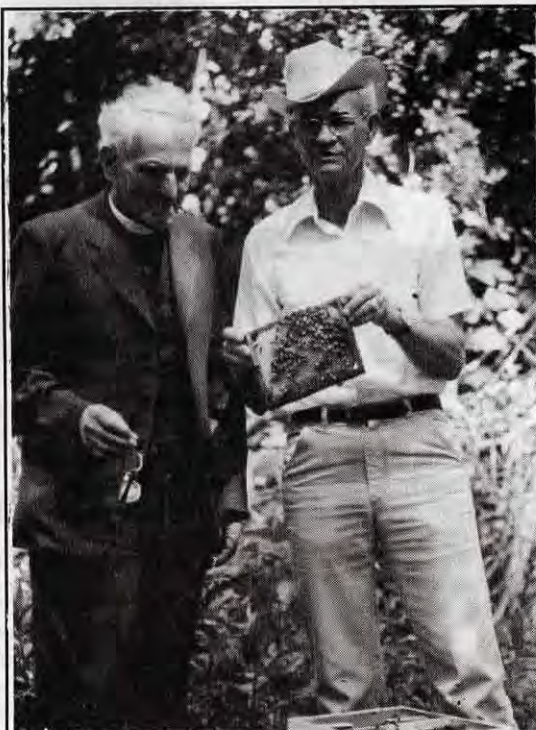
Editor's Note: *In hindsight that small, but very important detail should have been emphasized more. Ventilation is critical, but so is keeping mice out. Hardware cloth takes care of that, the typical small board traditionally stuck in the entrance doesn't. I'm sorry it worked the way it did for you because I too have made the same mistake. I would like to use your letter in the magazine as a reminder to our readers that what seems like a good idea may need to be viewed twice.*

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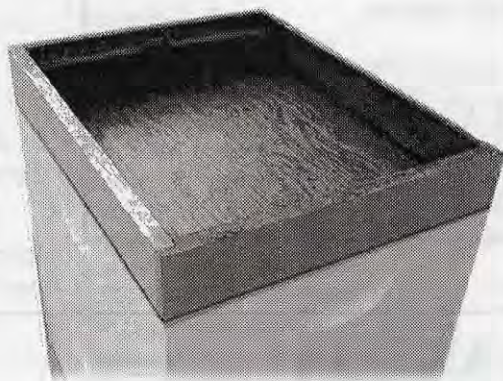
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commerce.com. \$33.00 plus shipping. For more information, visit www.bee-commerce.com, or call Howland Blackiston at 203 222 2268.



Liquid Smoke Ever catch anything on fire you didn't want to in an apiary? It's a lot of work explaining that to any land owner that lets you put your bees on his land.

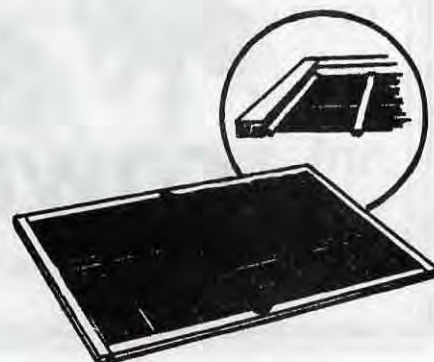
Each Spring I stand down wind of my smoker, but I just can't seem to stay down wind of the person I'm working next to! Breathing that stuff is bad enough. But when it's the middle of a Summer night, hot as an oven with bees that are as cross as heck after being loaded onto a truck, the last thing I want to do is try to keep a smoker going and tie ropes at the same time. I would much rather circle the truck in my forklift and squirt the entrances as I go by from 10 feet away. That's what I do with this new product called *Liquid Bee Smoker!* No more smokers. You always know how much smoke you have left. Sticks to them as you spray and they take that back into the hive as they go. Calms them like smoke. Use it like smoke. I keep extra trigger sprayers in my truck box. Virtually covers up the attack scent of the bees around cuffs and sleeves

and neck. Great for combining different hive parts to cover colony QMP. Smells like mint. Only a small amount of spearmint essential oil was needed to add to the smoke concentrate. A quart of *Liquid Bee Smoker* concentrate will make over 10 gallons of smoker fuel. Just mix it with any water you have and you have smoke in a bottle, a squirt bottle that is! All you need is H₂O. Remember the old saying, "Where there is smoke there is fire"? Well, not this time. I wonder if I could make a lamp out of a smoker?

Excluder From Brushy Mountain, Moravian Falls, NC comes a new design in queen excluders. The wood frame holds the grid securely, but the edges of the grid slope downwards so that the face of the grid is flush with the bottom edges of the frame. This leaves a beespace above the grid, and no space below. At \$8.95 for one the price isn't bad. Not having to clean it up every year is better.

Hive Tool Betterbee, Greenwich, NY celebrates 20 years in the supply business this year but has some new products to examine. A plastic hive divider fits snugly in a hive body to separate it into two smaller nucs. Queen excluder and adjustable height and width to accommodate every hive body on the market. For nucs or two-queen colonies. Only \$6.40.

Also, they introduce a major hive tool. 15-³/₄" long, with a scraper on one end and two hooks on the other, the unique aspect is that it is just slightly 'V' shaped, giving added prying power when separating glued-down supers. At \$17.95 it's nearly five times as expensive as the cheapest tool you can find, but it's also five times the tool.



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plus shipping	

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50 LB.	\$65.00 each
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6 OR MORE	\$155.00
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THE WISE GUY

And the winner is . . . Sioux Honey Association. This statement will ring true more and more into the future. If the current honey market continues, there will be less domestic honey produced due to low price. Sioux will still have their domestic producers, and any time they want more all they will need to do is ask.

Why would I want to be a Sioux member? Sioux honey is in a class by themselves when you look at their organization. If you sell them honey (I am not a member but have sold them honey), you will receive a data sheet from them showing you what was in your product. They do their own quality assurance, and yes, have a lab. They are the only packer that has taken the samples I have sent to them and told me they are the same as delivered.

When Sioux tells you they will pick up the honey on a certain date, they do it on that date. How many of you have been promised by other packers that your honey will be picked up, and months later you are waiting for them to make good on this promise? Then, when you have called them for the 20th time, they say that they can't pay you the price they quoted four months earlier. That has never happened with Sioux.

Sioux also pays immediately, if not sooner. Also they pay you what was quoted - plus the weights they claim are always the same as ours. I have a state-certified scale, and have observed that some packers always want to chisel you on weights. Not Sioux. How many times have you had to wait on your money from a packer? How many times have you had to call and remind the people who took your honey that they need to send you a check?

Sioux Honey spends their money on their organization, on such things as a laboratory, a marketing department, updating their plant, changing their labels, and other things to help the producer, while some other packers choose to build themselves new five-bedroom

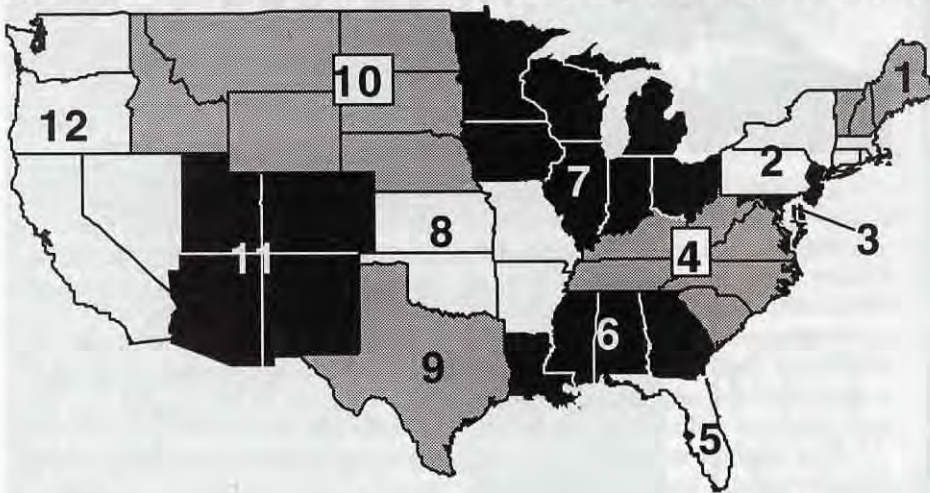
houses or spend lavishly on other personal items instead of spending the money on their own quality assurance. For example: I had one windbag packer pushing the quality assurance program tell the group he had one of his clients tell him he had bacteria in his honey!

He was only checking color and moisture, the same as most beekeepers do - that is his quality assurance. I assume he doesn't feel his customers need to know if there is a problem because he doesn't want to know himself. If there are chemicals in your honey, wouldn't you want to know before you put your name on it and sent it to your customer?

Sioux is a professional organization that markets honey. They are the best custodians of our product in this country hands down. They also communicate with their members on what to expect with regard to price and other matters concerning their future. As you know, this organization was started by beekeepers and is run by a board of beekeepers. In addition, their management team keeps their members' best interest their first priority, while independent packers have only their own self-interest in mind. The independents are pushing the American producer out. Example: Why would they offer the U.S. producer \$.50 to \$.52 per pound for white honey, when honey from South America costs \$.54? That is the fact of the situation. Does Sioux price their members below the import price? The fact of the matter is Sioux imports less than any other major packer.

Folks, we need more Sioux Honkeys. We need more honey buyers who keep the beekeepers' interests in mind. It's time, and I hear a rumor of a new co-op getting started in the Midwest. It seems this group has the support of the federal government and the state in which most of the producers reside. Wish them well and buy my honey. ☐

MAY - REGIONAL HONEY PRICE REPORT



Region 1

Prices up just a little for bulk, steady at wholesale and down just a tad at retail. Winter losses at about 15% with mites the biggest problem. Expansion plans mixed but most plan some.

Region 2

Prices steady for bulk, up for wholesale and steady at retail since last month. Winter losses at about 15-20% overall, with mites and starvation the greatest culprits. Optimism high as almost all have expansion plans this season.

Region 3

Bulk prices up a little, but wholesale and retail stronger than most. Winter losses low - 5-10% - with queenlessness and mites cited most often. Most plan to expand this season.

Region 4

Bulk prices lower this month, wholesale steady and some retail increasing, marginally. Winter losses range from 10-40%, but average out at about 25%. Mites, queenlessness and starvation most often the cause.

Region 5

Bulk prices down, wholesale down a little, but retail a bit improved since last month. Winter losses mixed, what with beetles, vandalism and mites entering in. From 0-100% reported. Expansion and replacement plans mixed also.

Region 6

Pail prices up, barrel prices down, wholesale steady but retail up. Overall about 15% Winter loss reported, with starvation, mites and queenlessness most often the causes. Most have replacement or expansion plans.

Region 7

Although not much, prices up across the board here this month. Winter losses range from 0-50%, but most in 5-10% area. Not bad. Mites and starvation by far the biggest problems. Expansion and replacement plans universal.

Region 8

Pail prices up a bit, barrel prices low but steady. Wholesale steady but retail took a dip this month. Winter losses range from 0 to only 25%, with less than 10% the average. Most plan to expand, but low prices have some staying steady.

Region 9

Prices down across the board, but mostly wholesale and retail. Winter losses average about 25%, with mites and starvation, followed by lots of queenless colonies the problems most cited.

Region 10

Barrel prices down, but pails, wholesale and retail up since last month. Winter losses difficult to determine by press time, but expansion plans not at the top of anybody's list at the moment.

Region 11

Both bulk and wholesale prices steady to up a bit, but retail down. Winter losses reported average about 25%, but range from 10-40%. Mites the biggest problem by far. Expansion plans mixed.

Region 12

Prices steady or up across the board. Winter losses reported about 20% average. Mites and queenlessness the greatest problems. Most have replacement or expansion plans.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Month	Last
Extracted honey sold bulk to Packers or Processors																
Wholesale Bulk																
60# Light	56.30	55.50	58.00	64.50	59.74	49.40	48.10	48.00	54.00	78.00	75.00	62.50	36.00-85.00	58.22	56.26	59.76
60# Amber	54.29	58.25	55.00	61.50	45.00	48.73	45.26	57.04	53.50	57.04	63.33	56.50	30.20-85.00	55.93	54.09	55.73
55 gal. Light	0.66	0.64	0.69	0.65	0.55	0.66	0.66	0.65	0.61	0.62	0.70	0.70	0.51-0.89	0.69	0.64	0.72
55 gal. Amber	0.61	0.67	0.63	0.65	0.47	0.66	0.63	0.63	0.60	0.60	0.63	0.66	0.47-0.80	0.63	0.62	0.66
Wholesale - Case Lots																
1/2# 24's	29.45	29.89	30.57	31.39	30.40	32.00	31.40	30.57	33.30	30.57	27.75	26.40	20.40-40.80	30.50	28.63	29.18
1# 24's	42.52	43.07	46.80	44.14	37.00	41.90	43.55	39.44	42.65	45.60	40.65	45.73	28.00-62.00	43.27	42.98	42.49
2# 12's	38.26	38.59	45.60	42.00	39.98	38.10	38.98	38.27	38.08	39.98	32.80	37.60	28.00-52.80	39.15	38.66	38.31
12 oz. Plas. 24's	36.62	38.54	43.20	36.71	39.20	35.45	37.44	33.66	33.93	43.20	38.47	36.70	26.40-54.00	37.21	37.16	35.99
5# 6's	40.37	41.88	44.12	47.67	36.55	45.25	39.63	40.06	40.27	37.50	33.78	38.70	28.00-54.00	41.45	41.05	42.02
Retail Honey Prices																
1/2#	1.78	1.66	2.83	2.17	1.10	1.87	1.82	1.73	1.80	1.83	2.43	1.70	1.10-3.10	1.81	1.83	1.82
12 oz. Plastic	2.19	2.19	2.50	2.34	2.27	2.16	2.07	2.19	2.26	2.45	2.51	2.11	1.39-3.20	2.23	2.23	2.26
1 lb. Glass	2.62	2.45	2.90	2.89	2.00	2.60	2.54	2.48	2.77	2.65	3.05	2.83	1.58-4.00	2.66	2.74	2.70
2 lb. Glass	4.41	4.29	4.80	5.02	4.43	4.48	4.27	3.91	5.00	4.43	4.63	4.43	2.79-6.00	4.51	4.53	4.40
3 lb. Glass	6.20	6.98	6.50	6.58	6.57	6.15	6.26	6.00	5.50	6.57	6.12	5.61	4.36-9.00	6.35	6.24	6.14
4 lb. Glass	7.57	7.31	8.01	8.25	8.01	7.30	8.70	7.01	8.35	8.21	7.93	8.01	5.60-10.50	7.93	7.93	7.91
5 lb. Glass	9.13	9.46	11.00	9.46	9.63	10.00	8.73	10.50	9.45	7.90	9.48	8.63	6.55-13.00	9.35	9.31	9.38
1# Cream	3.07	3.23	3.14	3.30	3.14	3.08	2.76	3.25	2.60	3.14	3.83	2.97	2.00-4.25	3.16	3.15	3.17
1# Comb	4.00	3.89	3.50	4.00	3.87	4.88	4.23	3.50	3.87	3.87	5.23	4.73	1.95-5.50	4.17	4.37	4.16
Round Plastic	3.53	3.19	3.50	3.68	3.63	4.50	3.53	3.66	3.63	3.63	4.25	3.97	2.75-4.50	3.65	3.86	3.67
Wax (Light)	2.18	3.23	3.00	1.69	1.00	2.41	1.69	1.88	2.00	1.40	2.50	2.13	1.00-6.00	2.16	2.41	1.82
Wax (Dark)	1.94	2.74	2.75	1.43	0.90	2.31	1.60	1.55	1.00	1.30	2.00	1.83	0.90-5.00	1.94	2.05	1.50
Poll. Fee/Col.	37.51	39.63	30.00	39.17	30.00	36.33	38.67	39.67	35.00	41.07	50.00	33.75	25.00-60.00	38.20	37.47	38.34

How Much Honey?

Honey produced in the U.S. isn't the whole story.

Each year the USDA conducts a survey of beekeepers and others to determine the number of colonies in each state, the average amount of honey produced per colony, the price it sold for, how much honey they held back and the value of what they produced. That report was published here last month. Then, in March, the U.S. Honey Market Report publishes the previous years total of honey imports and exports, by country, including the price.

Two things must be considered. First, the USDA survey reports production only from beekeepers with more than five colonies. Second, for the moment let's stick with those figures, even though we all know those of us with only one to four colonies don't just dump that crop down the drain.

The *U.S. Imports, 1998* chart shows how much honey we imported from each country, and the average price per pound paid in 1998. We imported almost 127 million pounds of honey last year. Argentina sent 69 million of those pounds, about 54% of the total. China donated 24% of the total. Nearly 20 other countries contributed the remaining 23%.

Now, combining the USDA and Honey Market reports we have the amount of honey produced in the U.S., the amount imported, the amount left from the previous year, and the amount exported. If you add U.S. production to imports, subtract exports, and subtract the amount of the current year's production held over to the next year you end up with (approximately) the



*A Somewhat Fuzzy
Picture From
USDA
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amount of honey consumed in the U.S. that year. Get that year's population in the U.S., divide the amount of honey consumed by the number of people, and you have how much honey each person in the U.S. consumed - per capita consumption.

We did just that for the last six years. The results are interesting, with per capita consumption ranging from a high of 1.18 lbs./person to a low of 0.88 lbs./person. Interestingly, in 1998, 220,311,000 lbs. were produced in the U.S. Subtract stocks of 80,808,000 and exports of 11,053,550 lbs. and what's left, what portion of U.S. honey consumed by U.S. people is 128,449,450 lbs. Now, look at the import figure of 127,919,822 lbs. Almost exactly half the honey consumed in the U.S. last year came from offshore.

But don't forget those beekeepers with fewer than five colonies. They make a contribution to the honey produced here but it generally remains hidden. Even if you eat all of the honey you produce, or give it away, somebody, somewhere used it and didn't get counted. How much? The unanswered question without doubt.

I've always had a figure in the back of my head, based on the number of beekeepers I know with just a few colonies that eat or give away all their honey, plus those that have quite a few but tend to give some away or sell for cash. Don't forget yard rents and other "invisible" crop consumption. And I most certainly am missing some. For the sake of argument let's double my 15%

HONEY IMPORTS TO U.S. 1998

Country	lbs. imported	\$CIF	Avg. \$/lb.
Canada	11,776,028	\$7,484,923	.635
Mexico	7,195,010	\$3,991,368	.554
Chile	134,129	\$80,590	.600
Uruguay	216,152	\$126,005	.583
Argentina	69,049,002	\$40,237,711	.583
India	967,468	\$530,448	.548
Vietnam	6,467,476	\$2,948,544	.456
China, Main	30,231,392	\$17,553,634	.581
Australia	271,454	\$259,607	.956
Germany	213,596	\$266,079	1.25
All Others	233,058	\$420,865	1.80
Total	126,919,822	\$73,996,862	.583

Continued on Next Page

Honey Consumption In U.S.

Year	Produced in U.S. (plus)	Imports (minus)	Stocks (minus)	Exports (±)	Population	=	USDA lb./person @	Avg. Price	Adjusted lb./person
1993	230,655,000	131,242,940	49,049,000	9,230,287	257,752,702		1.18	\$.539	1.45
1994	217,168,000	120,941,467	59,813,000	8,551,715	260,292,437		1.04	.528	1.29
1995	210,516,000	86,189,176	42,226,000	22,256,645	262,760,639		.88	.685	1.12
1996	198,197,000	146,812,596	46,967,000	11,559,508	265,179,411		1.08	.888	1.46
1997	196,536,000	162,720,710	70,696,000	9,042,510	267,636,061		1.04	.752	1.26
1998	220,311,000	126,919,822	80,808,000	11,053,550	270,098,313		.945	.655	1.19

to 30%. That is, let's increase the honey produced in the U.S. each year by 30%, while the population, imports and exports remain the same. The result, if you are comfortable with my adjusted 30% guess, increases per capita consumption by about a half pound per person.

Also included in the above chart is the average price per pound paid for all honey each year.

Imports are, well, erratic and shaped by many factors – price an important factor.

Does a low average price change where honey is sold, thus changing the figures? For instance, if a medium sized producer isn't getting the price at bulk he feels is adequate, will he find an alternative higher priced market? And, will that market be in the main stream of

business? Or will it be a cash sale, and be missed by the survey?

What effect does high price have on per capita consumption? Well, with the range of how much (measured) honey was eaten during this time ranging from 14-19 ounces per person, price seems to have little effect. But when you add in that unreported 30% production, per capita consumption, interestingly, follows price – the higher the average price, the more gets eaten, kind of, anyway.

What needs to happen to develop more meaningful figures is to get a handle on those that slip through the cracks. Are there enough of you out there to make a difference? Or, are these USDA figures correct? Let's hope there's still room for improvement. **EC**



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? DO YOU KNOW ?

Spring Has Sprung
Clarence Collison
Mississippi State University

Spring is an extremely busy time of year for beekeepers especially if they rent colonies for orchard pollination. Having colonies in excellent condition for pollination as well as early nectar flows requires intense management early in the Spring. The assemblage of new equipment and hive repairs need to be completed prior to moving colonies for pollination. In addition to pro-

ducing strong colonies, it is important that early Spring management manipulations serve as a means of swarm prevention as well as enhancing conditions for colony development. Mite and disease control efforts are also important. Take a few minutes and answer the following to determine how well you understand the principles of Spring management and pollination.

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

1. ___ Constructing hives out of commercially treated lumber by the process known as "Wolmanizing" is recommended for extending the life of the equipment.
2. ___ Bottom boards made of cedar, cypress or redwood generally last longer than those made of pine.
3. ___ Migratory lids are normally used without inner covers.
4. ___ The number of foraging honey bees (potential pollinators) flying from a colony is directly proportional to the overall adult population.
5. ___ Honey bee colonies should be moved into a target crop needing pollination 24 to 48 hours before the flowers open.
6. ___ A good way to stop the swarming impulse is to give the colony frames of comb foundation to be drawn out.
7. ___ Beekeepers should never allow colonies to get down to less than 10 to 15 pounds of honey.
8. Please explain why beehives are only painted on the outside. (2 points).
9. What are the two primary functions of comb in the honey bee colony? (2 points)
10. Explain why these are important considerations in keeping bees.
 - A. Hive entrance facing in an easterly or southerly direction.
 - B. Keeping the hive up off the ground.
 - C. Having the front of the hive slightly lower than the rear of the hive.
 - D. Feeding all colonies some sugar syrup early in the Spring.
11. What is the primary cause of swarming in a honey bee colony? (1 point).
12. Please explain why adding honey supers on top of a colony does not prevent swarming. (1 point).
13. Why is it recommended that a beekeeper should over-super their colonies in late spring and early summer. (1 point).
14. Name two ways in which hives are fastened together so that they can be moved from one location to another. (2 points).
15. List 5 risks and problems that beekeepers face in moving bees for pollination. (5 points).

ANSWERS ON PAGE 50



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Roger Morse

Research Review

"Bumble bees, blueberries and choosing a new home."

As the human population on earth increases, there is increased international traffic and a greater number of accidental transfers of insects and other animals from one area to another. A recent paper from Australia complains about finding a new bumble bee (*Bombus terrestris*) in Tasmania, one of the Australian states, in 1992. This bumble bee is a native of Europe, and was taken to New Zealand over 100 years ago to pollinate red clover. The paper I cite below suggests that this bumble bee was accidentally carried to Australia recently, packed away in some cargo from New Zealand. I suppose it is easy enough for a fertilized queen to hibernate in a shipping crate as well as under bark or a stone, which is where I presume they normally spend the Winter.

There is no question that these bumble bees will compete with native ground and twig nesting bees in Tasmania, and this is discussed. However, the authors' statement that this bumble bee "also has the potential to impact on commercial honey production" is going a bit too far. I'll admit, however, that such a statement is an attention getter.

Bombus terrestris is a native of Europe. It is not a serious competitor with honey bees there or in New Zealand, so why would someone think it may be a problem for honey bees in Australia? Exaggeration is a tool used by people from all corners of the earth, even many scientists I know. One must be wary!

Hingston, A.B. and P.B. McQuillan. *Does the recently introduced bumble bee, Bombus terrestris, threaten Australian ecosystems?* Australian Journal of Ecology 23: 539-549. 1998.

Blueberries in Warm FL!

There are about 2,000 acres' of blueberries being grown in Florida, which now ranks fifth among the blueberry producing states (after Maine, Michigan, New Jersey and

North Carolina). We normally think of blueberries as being grown in the North only. What is especially interesting is that there are successful plantings in the southern third of Florida, and apparently more are in the works.

The earliest Florida blueberries are selling for up to \$10 a pound on about April 1, but that drops to about \$5 a pound by the first of May. Despite the extra value of early berries, the growers I have talked to are not too concerned with pollination or the thought that strong pollination might speed up fruit development. The problem may be the newness of the industry in Florida. The varieties being grown are very different from both the low-bush and high-bush berries being grown in the North and their pollination requirements have not been studied.

Blueberry growers in Maine rented nearly 50,000 colonies of honey bees for pollination last year, which is far more than were rented for any other crop in the eastern states. If Florida blueberries are at all like their northern cousins this is a new industry worth watching.

Spence, C. *The blueberry boom.* Impact 14: 20-21. 1999.

Selecting A New Home

When a colony of honey bees swarms, the bees in the swarm must find a new home. To learn how they may do so, the researchers listed below went into the desert where there were no hollow trees or buildings that might provide cavities that bees could use for a nest. In this place, they gave the bees in a swarm a choice of two man-made hives. The scouts from the swarm reported there was more than one site, but after a few days it was found that all of the dances focused "on the same high-quality site."

Two thoughts have been suggested as to how the decision is made: The scouts may compare

sites, or they may drop out of the process once they have reported on the sites they find, and let others they recruit visit the site and make the decision. Comparing sites would be more involved, while letting others make the final decision would follow "simple rules based on local information."

It was found that the simpler of the two systems was used. The site that was selected for a new home depended upon the proportion of the dancers that preferred that site. In other words, each scout that visited a site evaluated it within the limits of her own ability, and comparing sites was not important.

To test this hypothesis further, the researchers marked and videotaped the dancing bees. If bees visited more than one site, the "cross-over" bees, that is the bees that visited a second site, were captured and removed. Under these circumstances it was found that preventing the scouts from visiting two sites and making comparisons did not delay the decision making process.

It is concluded that direct comparison of potential home sites is not necessary for bees to make a decision about a new home. The first scouts to find a home of which they approve apparently report their find through dancing. But they then let the bees they recruit visit the site and decide for themselves if it is acceptable or not. If the succeeding bees do not like the site, they drop out of the system so to speak, and the site that wins is the one for which the greatest number of bees dance.

The researchers conclude that the decision is not based on a complex system, but that its workings are self-organized and determined by positive feedback. "Nature can build complexity in this way by using local information and simple rules."

Visscher, P.K. and S. Camazine. *Collective decisions and cognition in bees.* Nature 397: 400. 1999.



Mark Winston

Multitasking

"I'm both proud of and repelled by my ability to multitask, since it reflects the best of our human ability to perform complex tasks, but also the worst of our capacity to accept an increasing amount of chaos and tension in our lives."

Human language is a truly remarkable evolutionary innovation, allowing for extraordinarily detailed communication and adapting quickly to novel trends in human life with the creation of subtle new words that capture telling snapshots of our nature. Take the word "multitasking," a term originated by computer nerds to describe how computers can do more than one thing at once, but a word that has matured to encompass the essence of what modern life is all about. In any five-minute period, I might simultaneously type an answer to an e-mail message concerning the upcoming Apimondia conference while talking to my wife on the phone about our dinner plans, and at the same time beckon to a waiting student to come into my office and have a seat until I'm done with my computer/phone output. If I'm really cruising, I might even be drinking a cup of coffee in between keystrokes, "yes, dears," and gestures, and if it's a personal best moment in sensory overload, I could file a paper or two besides.

I'm both proud of and repelled by my ability to multitask, since it reflects the best of our human ability to perform complex tasks, but also the worst of our capacity to accept an increasing amount of chaos and tension in our lives. But, it is of some comfort to me that we humans are not alone. Bees multitask also, and share with us the capability to perform complex and simultaneous tasks. Further, the subtlety emerging from investigations into honey

bee communication is beginning to indicate a truly astounding complexity well beyond anything we might have expected from a lowly insect with a brain the size of a small ball bearing.

Think about a typical five-minute period in the life of a young worker bee. She might touch antennae with a fellow worker, passing around queen pheromones that communicate the colony's queenright state. Then, satisfied that all is well, her head ducks into a nearby cell to secrete some brood food to a young larva, a job that requires her to determine the age, sex and caste of this tiny bee baby in order to dispense the proper type and amount of food. Upon backing out of the cell, she has to make a decision to ignore the dancing bees in her midst, since it's not her time to forage, and then decide where to go and what to do next.

Even the first interaction, the one that tells our worker bee that her queen is alive and well, is turning out to be almost hopelessly complicated in the number, subtlety and source of chemicals involved, and the implications to the perceiving worker of the queen's presence. Early on, almost 40 years ago, "queen substance" was discovered, and at that time it was thought to be one compound from the queen's mandibular glands with the chemical nickname 9ODA. More recently, our understanding of the chemical repertoire from the mandibular glands has expanded, and we now know of five compounds from that

gland that act together in mediating worker behavior and physiology. All five compounds together have been nicknamed QMP for queen mandibular pheromone, and all must be present to get the full effect of the queen's mandibular gland influence.

Astoundingly, however, these five components are proving to be only a part of the queen's message. The evidence for incompleteness appeared almost as soon as the five-component QMP blend was identified. While most worker bees respond to a synthetic blend of QMP by forming a retinue around a glass lure baited with the substances, bees from some colonies ignore the blend. Yet, these same bees will find their queen and form a retinue around her with no problem, indicating that they perceive additional substances to complete the queen's chemical message. We now have identified some of these compounds, which also originate in the queen's head, but not in the mandibular glands. Interestingly, the new substances are unattractive on their own, but when mixed with QMP double or triple worker bee responses to QMP. In total, there now appear to be between eight and 12 individual compounds produced by the queen that are involved in retinue formation, an amazingly complex message mediating a seemingly simple worker response.

The queen pheromone story is becoming even more layered as we learn about the diversity of functions and other glandular sources of her chemical influence. For example, we

Continued on Next Page

“Perhaps we shouldn’t be surprised at the subtlety and intricacy of honey bee multitasking. A colony is no simpler an environment in which to function than the physically larger human world we live in.”

have known for some time that queen pheromones inhibit workers from rearing new queens, and are involved in suppressing worker ovary development and egg laying. More recently, research has demonstrated that queen pheromone also acts like a timekeeper to influence when worker bees begin to forage. Workers move from in-hive tasks to foraging as they age, and this change is associated with increased secretion of a hormone called juvenile hormone in worker bees. Queen pheromones delay the transition by inhibiting the secretion of juvenile hormone, thereby insuring that colonies will maintain a good balance between hive work and foraging tasks.

But even this new function of mediating age-based task performance is only scratching the surface of the complex odor symphony that permeates the hive. The queen’s head pheromones alone do not fully explain any aspect of worker behavior. Synthetic queen pheromone blends will not completely inhibit queen rearing, worker ovary development, or the transition to foraging. Each of these functions requires additional pheromones produced by brood, and work by Yves LeConte from France is beginning to reveal that these brood odors also are complex, multi-component blends. In addition, extracts from some of the queen’s abdominal glands are just beginning to be explored, and these glands also appear to secrete substances with profound effects on worker bees.

The cascade of biologically meaningful odors is not a unified message, but rather one in which different components are more prominent for different tasks. It’s a bit like a hockey team in which the forwards are more important to score goals, the defense has more of a role in preventing goals, and the

goalie is highly specialized for guarding the net. Yet, the defense often joins the rush to put the puck toward the net, and even the heavily protected goalie might move out of his net to capture the puck and pass it quickly forward to his goal-storming teammates.

Similarly, the queen and brood messages are needed in combination to elicit full responses on the part of worker bees, but each is more important in one context or another. For example, the queen’s mandibular pheromone is the most significant aspect of queen rearing inhibition, but brood pheromones add to the queen’s effect. In contrast, brood odors are the primary factor suppressing worker ovary development, but queen compounds are needed for full inhibitory activity. For foraging, queen and brood pheromones appear to play equal roles in the suppression of juvenile hormone secretion and the delay of foraging until older ages.

We’re also just beginning to understand the complex switching and internal signaling devices by which multitasking bees define the incoming signals and coordinate their physiological and behavioral responses. We researchers now are aware that physical changes in worker bee brains can occur due to the presence or absence of queen pheromones, and also have begun to document in some detail the glandular responses within worker bees that lead to changes in behaviors. Further, we are close to understanding the precise genetic makeup of bees that makes them more or less likely to participate in particular activities, and the next steps will find us with a complete understanding of the mechanisms from gene to behavior that underlie honey bee complexity.

Perhaps we shouldn’t be surprised at the subtlety and intricacy

of honey bee multitasking. A colony is no simpler an environment in which to function than the physically larger human world we live in. We assume that one bee is pretty much the same as the next because we can’t see any obvious physical differences, yet each bee carries a slightly different chemical message that transmits a level of individuality and personal history that appears to be on a par with differences between individual humans. A bee’s tasks are performed in an environment requiring considerable ability to discriminate between very subtle messages from her colony mates, not much different from the underlying messages we provide each other to facilitate the myriad tasks we perform in the human world.

As an exercise, put on a blindfold and plug your ears, and try to use only your sense of smell to perceive the world around you. Even further, see how many tasks you can perform when your primary sensory inputs have been restricted to odors. Then, imagine a bee without her antennae, forced to rely on her weaker visual and auditory senses, much as you tried to depend only on chemicals to define and work in your world. No, I think we underestimate the worker bee only because her senses and tasks are foreign to us. Put yourself in her tarsi, and you’ll find an organism no less multitask-able and sensorially rich than ourselves. Perhaps extraordinary isn’t the right word; it is, after all, entirely ordinary that the natural world’s subtlety should match our human complexity. **EC**

Mark Winston is a professor and researcher at Simon Fraser University, Burnaby, B.C. Canada. He is program director for Apimondia 1999.

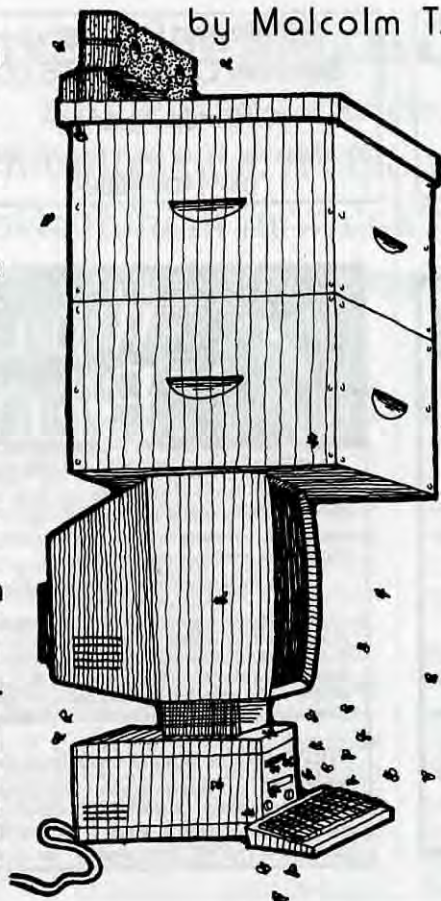
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by Malcolm T. Sanford



This year will be a wonderful opportunity for North American beekeepers to attend one of the world's premier beekeeping events. Apimondia will convene September 12-18, 1999 in beautiful Vancouver, B.C., just north of the United States' border. It is becoming more and more common for conventions to be advertised on and administered by World Wide Web sites. Apimondia '99 is no exception. The URL is <http://www.apimondia99.ca/>.

As for most official events in Canada, the information is presented both in **English** and **French**. In addition, the first and second circulars are also in **Spanish** and **German**. A striking feature of the home page is the distinctive logo. According to **web site**, "The Apimondia '99 logo is based on traditional styles used by aboriginal groups on the west coast of British Columbia, Canada. The four bees symbolize the four compass directions as well as the four elements of earth, fire, water, and air, important motifs in native art. Each pair of bees is touching antennae, symbolic of the communication between beekeepers that will occur at Apimondia '99. The hexagonal background represents the cells in a hive, but also the links between individual beekeepers joined together and connecting to the international world of apiculture. The golden colour of the logo symbolizes both the honey produced by the bees and the economic benefits derived from beekeeping."

Other prominent graphics on the page are those of the **official sponsors**. These include a mixture of both commercial enterprises (**Dadant & Sons, Ltd.**, **Wellmark International**, **Arataki Honey, Ltd.**, **Medivet Pharmaceuticals**, **Western Wax Works, Ltd.**

Apimondia 1999

and **Bee Maid Honey Cooperative.**), quasi-public (**National Honey Board**) and public (**Simon Fraser University**, **British Columbia Ministry of Agriculture and Food**, **Agriculture and Agri-food of Canada**). To my knowledge this is the first time official sponsors have been engaged to help support the Apimondia convention. In the past, however, governments in countries subsidized the meeting heavily, especially those in Eastern Europe that were parts of the former Soviet Union. These meetings have traditionally convened every two years, often rotating with a European country and one from elsewhere. Notable meetings outside Europe have been those held in China, México and Brazil. This is the first time North America north of México has sponsored the event since it was held in the United States back in 1967 in the state of Maryland. That event was significant, according to Apimondia president, Raymond Borneck of France. He states in the official invitation that "at that time, the Maryland congress was the occasion for the meeting of two distinct worlds, the West and the East, finally realizing the goal of Apimondia to over-rid political and language differences in world beekeeping."

Apimondia is officially called the International Federation of Beekeeper Associations. It holds an international meeting every two years and publishes the journal called *Apiacta*. Apimondia has its own **Web site**. It includes 55 national beekeeping associations in 49 countries, representing all continents and encompassing over 5 million member beekeepers.


The Canadian meeting is expected to be extraordinary in several respects, according to **Dr. Mark Winston**, one of the organizers quoted in official **press releases** that are part of the Web site. "We're very proud of how **our program** has developed. We consulted the beekeeping communities in over 40 countries to find the most exciting new research, the best speakers, the most highly esteemed scientists. Over 85% of the speakers we invited have already accepted - an unheard-of response for an international meeting - and indicative of the kind of support we have been receiving. Whether a participant's interest is in bee biology, queen rearing, beekeeping equipment, management, pollination, diseases and parasites, or apitherapy - there will be significant sessions on the subject, delivered by extraordinary speakers." The official theme of the congress says it all: Beekeeping in the New Millennium.

Although the program is expected to be exceptional, it is probably the exposition that will be of most interest to practicing beekeepers. My recent experiences in Europe and Latin America indicate that although the United States has been looked to as a leader in beekeeping equipment and product development, many other countries have made significant headway in developing quantity and quality of beekeeping paraphernalia offered to the world market. This will be the only time for North American beekeepers to see how far many foreign entrepreneurs have come in this area. I believe many will be surprised. According to a **press release** on the Web site, "Under the glistening white sails of the west coast's premier convention facility are over 6,000

square metres (60,000 square feet) of exhibit space, with wonderful natural light provided through translucent ceilings up to 150 feet high, all in the same grand facility as the convention sessions, lounge and food courts. Roomy, carpeted and fully air-conditioned, the trade show area will provide convention participants, whether exhibitors or registrants, with comfortable access to the best the beekeeping world has to offer. We have incorporated other elements of Apimondia, especially the posters for research projects, right onto the ApiExpo floor," says trade show coordinator Paul van Westendorp. By having this seamless connection between the scientific program and the trade show all in one envelope, in such incomparable facilities, we have made ApiExpo a deliberately active and integrated part of the Congress."

The Web site has an enormous amount of information for potential exhibitors at the **ApiExpo**. It features a complete map of the **floor plan** of the Vancouver Trade Centre, showing the organization of the booth, as well as a complete listing of those signed on as exhibitors. Some 80 percent of the exhibit area was sponsored for by early March this year and the remainder

should be sold by early summer.

Both first and second circulars have been published. The latter features a listing of the Canadian Organizing Committee, host organizations, Apimondia Executive Committee and the Presidents of the seven standing commissions. It also includes complete information on **registration, accommodations and hotels, technical tours, and contests**. The registration, accommodation and contest entry forms are all available in **Adobe Acrobat® .pdf file format**. Those expecting to attend this one-of-a-kind convention should plan to register early. The deadline for early birds is June 1. After that expenses increase considerably and accommodations become more scarce. For those without Web access, the second circular can be requested from **Venue West Conference Services**, #645-375 Water St., Vancouver, BC, Canada V6C 3L6, Tel: 604-681-5226, Fax: 604-681-2503. 

Dr. Sanford is Extension Specialist in Apiculture, University of Florida. He publishes the APIS Newsletter: <http://www.ifas.ufl.edu/~mts/apishtm/apis.htm>

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Bee Culture's Beeyard

Catching Up

On behalf of the "Virtual Beeyard" project, I have continued to work on equipment assembly for the past few weeks. This task quickly loses its excitement for me. On many occasions I have recommended that woodenware be assembled during winter months, but I soon realized there are not enough winter months, ergo, I am behind.

At first glance, instructions for equipment assembly are simple. In fact, with finger jointed boxes, the only thing you can really do wrong is place the handhold inside the box rather than face it outward. With equipment supplied with either rabbit or drawer joints, you are prohibited from putting the handholds inside, but with just a bit of inattention, you can successfully put the hand upside down. I know. I know. That will never happen to you, but I contend that after you have assembled a number of these boxes, your brain becomes mushy. If you assemble boxes long enough, you will successfully make the mistake.

Though simple to accomplish, as you would expect, I do have some suggestions that will make the assembly process go more smoothly and the equipment last longer.

Get off your wallet Woodenware from the manufacturer comes with straight-shanked, galvanized nails and no glue. I recommend that you go straight to your local home improvement supply store and buy 3½" spiral-shanked, galvanized nails and

save the ones that came with the equipment for another project some other time. While you are shopping, pick up a bottle of the new, waterproof, polyurethane glue. Gorilla Glue or ProBond are two brand name examples. This type of glue is expensive (\$7.99 for eight ounces), waterproof, bonds to nearly anything, and is "super strong", no bee pun intended. This glue actually requires a small amount of water to cure properly. The wood of the hives I assembled had a moisture content of about 7% which is good. Wood dried to this percentage will be more stable and suffer less shrinkage than wood of higher water content – but the polyurethane glue will not have enough moisture in this wood to cure to its strongest possibility. Take an old Windex bottle, or any such atomizer, and lightly spray wa-

ter on one surface a few minutes before it is to be glued. Lastly, pick up a few 2" galvanized deck screws for use throughout the assembly process.

Think carpentry – not cabinet making The wood in the unassembled hive is always pretty and has a nice smell, which draws me to varnishes rather than paint, but more on that later. Though the boards are normally clear and knot free, the joint tolerances are still not great on any of the equipment that I have recently assembled. Frequently the wood is bowed or is cut scant (short) or proud (long). This is no reflection on the manufacturing companies. Wide boards tend to cup and that tends to give you grief as you assemble them. It's okay. We are building a sturdy hive - not sophis-

Use clamps to pull in order to assemble equipment soundly.



Continued on Next Page



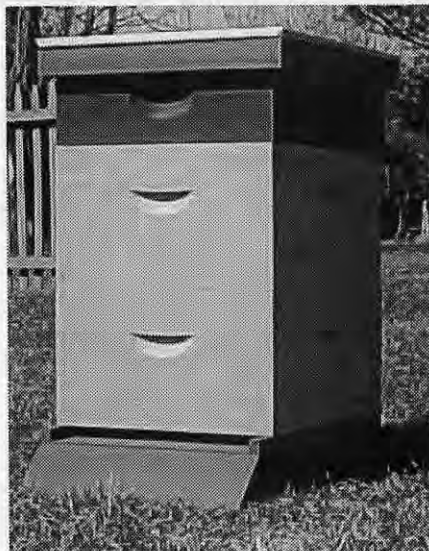
A "super horse" with carrying handle.

ticated furniture. Even if the joints are not perfect, they will be strong.

Put it together correctly Bee equipment has become remarkably expensive, as has your time. Put it together correctly in order to get the most use from it. Most common hive bodies will last about seven years (without major repair). I like for mine to go much longer than that. I suggest the following tools and supplies for good hive assembly:

- a. claw hammer
- b. marking gauge
- c. 2 - 4 foot bar clamps
- d. drill with 1/8" bit

The completed hive.



- e. glue
- f. spiral shanked nails
- g. framing square
- h. galvanized screws (2")
- i. copper brads

Lay the hive body parts out in an orderly fashion with all tools and nails at the ready. Apply glue. Use the bar clamps to pull out any bows or cups in the wood. Put two nails - one in the first holes to attach (maybe wet first, depending on the glue mentioned earlier) both sides to the end. Then turn the entire contraption around, re-clamp, and put two nails in the first two holes on the opposite side. If necessary, clamp the center of the hive to pull the sides in tightly. I hypothesize that the waterproof glue will coat the inside of the joint where paint can't reach, (but water can penetrate) thereby preventing rot. Finally, remove the clamps and perform the same sequence on the opposite end of the box. Before nailing through the sides, check the box to make certain it is square. And before nailing the side, drill pilot holes to prevent the sides from splitting near the ends. A marking gauge is handy for scribing pilot-hole lines. Though probably not much better, when assembling outer covers, bottom boards and hive stands, I am increasingly leaning toward using galvanized screws for assembly. Screws hold better. When position-

ing the galvanized sheet on the outer cover, I like to use copper brads (again with an eye toward long-term use).

Paint everything Whereas I normally don't mind the hammering and nailing too badly, I thoroughly dislike painting. I don't know why. Again, though money is important, I want to perform this task as rarely as possible. Plus, the equipment will never be as easy to paint as it is at this point. I suggest you immediately get paint on your hands and shoes - and then you can apply paint with abandon. Beekeepers have historically used white paint. But as with spiral-shanked nails and polyurethane glue, modern latex paint comes in innumerable colors. I chose a color scheme off the shelf from Sherwin-Williams and used solid stain. Though I did not paint the insides of the equipment nor the inside of the telescoping cover, I did paint all the bottom board. My reasoning was that it was easier and neater just to paint the entire bottom that to attempt to "trim it out."

Be prepared for the painting process to take considerably longer than the assembly process. Though latex *dries* rapidly, it does not *cure* instantly. Painting the upper and lower edges of the equipment adds to the time required to apply paint. I would actually allow about two days. Much faster than that and the paint will pull from the equipment if you stack it. For bigger jobs, airless paint sprayers are much faster, but the drying time is the same. Apply at least two coats on everything - three would be better.

I also varnish the inner cover with a water-based, high gloss polyurethane varnish. It protects the inner cover a bit and allows for easier removal of propolis and wax. This step is not necessary and may be even be offensive to some. Various types of exterior varnishes are available that would be appropriate for hive finishing. A varnished bee hive looks great, but will require maintenance much sooner than a pigmented finish. An unhappy compromise is to use a "solid-stain" that really appears to be just a thin paint. That is the product I used.

A super horse I built something

called a super horse for use in the yard. I have never used one before but neither have I ever been this age before. I am not becoming lazier, but am trying to become smarter. I lifted the concept from Laidlaw and Page's queen rearing book, *Queen Rearing and Queen Breeding*. I didn't make mine as large as theirs and changed the leg attachment configuration in order to make it more stable. I also made it from treated lumber. The unit is 30 inches long, 22 inches high and 15 inches wide. Additionally, I improvised a top that simply sits on the super horse. I have found this low table handy for jobs other than in the bee yard; for instance a painting table. At 30 inches long, you will not be able to sit two supers side by side, but I wanted it short enough to be lightweight and to be able to get it into a car without losing all my religious training.

The Bees As of late March, the three nucs are still surviving very well. Thanks to earlier Varroa kills, I have plenty of honey in deep frames for emergency food if they should need it. There is a sense of wellness that a beekeeper can feel at times. On one of the first warm days in March, the bees were bringing in early pollen from maples and willows. There were on-going signs of house cleaning. All seemed in order. With each passing day, the chances for the three nuc's survival improve. I will keep you informed.

You may recall from past articles that I combined a queenless nuc with another during some bad weather. It was a managerial risk that worked. After initiating the combination procedure, the weather dropped to near freezing. I worried that the caged queen would become chilled, but there was nothing I could do but wait. Finally, four days later on a rainy, but warmer day I reopened the colony and released the queen. The bees seemed a bit aggressive, but again, the best thing for me to do was to cause the least disturbance possible. Everything worked. The queen was accepted, but I must tell you that combining weak colonies during late winter is risky at best and should be viewed as an emergency procedure.

"Dead-Outs" and mice Now, I

must deal with quite a bit of equipment from the three dead colonies. This is a messy job that is not enjoyable. I was surprised at how active the field mice became during late winter. I had always felt that putting in entrance reducers in late fall was the main procedure for controlling mice. But once winter was underway, all self-respecting mice should have found homes. Well, it looks as though mice will readily consider relocating if better housing becomes available. So...I found myself putting in entrance reducers on dead colonies during late winter to keep mice out. That procedure would have been an article candidate for the BC series I just completed, "Not in Any Book."

Next Month Though I have cleaned the shed, it still needs washing and painting. It was a mess. I also will need to cut last year's

grass and continue to nurture the three nucs. A big task will be to refurbish the dead-out equipment in preparation for packages, splits and swarms. Though I'm not caught up, I have gotten quite a bit accomplished since January.

Your letters and electronic communications If you choose to communicate with me concerning BC articles, it will be helpful to us both if you will include your location. Many times answers and suggestions depend on the climate within your area - information that is not given within an email address. Thanks for your readership and your suggestions. ☐

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I Wrote This In March, But Now It's May

As I write this, it is March, but as you read what I have written, it is May. So I need you to go back in time a bit. Yesterday was one of those early spring days that you remember for a lifetime. The sky was blue, the temperature was nice, and the bees were flying. They were bringing in both maple and willow pollen - a sure indicator of spring. If I can hang on one more month, three 5-frame nucs will have made it though the winter....but it's still not too late for them to die. Thanks to *Varroa* kills, I have plenty of honey to give them as they need it. I mentioned in earlier articles that I am anxious to determine if making fall splits, headed by new queens, can survive Ohio winters. I have put out some pollen powdered substitute, but they have not been wild about it. The placement of pollen substitute on colonies should be done early - in Ohio as early as mid February. I always forget. Though I am using the powdered form, I increasingly feel that I prefer the patty form fed within the colony. By the time foragers can fly to the powdered pollen substitute dispenser, the weather is warm enough for them to forage on natu-

ral sources. If fed within the colony, they can feed on it at their leisure.

What's left of the yard? I am down to three nucs, one of which is weak. Last month, I told you that I had one full-sized colony remaining that I gave a 50/50 chance of survival. It died two weeks ago from tracheal mites. Though treated for *Varroa*, none of the yard had been treated for tracheal mites. I put one Apistan strip within the nucs (one strip per five frames of brood) and will take it out of the colonies as the spring season approaches (as per label instructions). I have three packages and about 3 splits coming this spring. I will keep you informed as they arrive and are installed in my newly painted equipment. I'm looking forward to their arrival.

Mice, mice everywhere. I have been surprised by the activity of mice within dead equipment. I had always thought that mice found a place to call home for the winter and stayed in that general vicinity for the winter. No. These guys are moving into my dead hives and causing typical mouse damage in the dead of winter. The equipment is still sitting outside.

MISSISSIPPI SPLIT

Making Bees With Adee Honey Farms

Kim Flottum

Richard Adee is a beekeeper's beekeeper. Not many people know that. Richard's larger, more public image is that of an impeccably dressed, soft spoken, but very effective political leader. He is, after all, the President of The American Honey Producers, and has spent weeks and months in Washington campaigning for the support he, and his group feel should be coming from Congress. However, when in a beeyard his beekeeping skills are far more evident than his political savvy, and the pinnacle of his skills, and those of his well seasoned crew is reached when he's in Mississippi each spring. This twenty plus crew, which includes his son Kelvin, and brother Bob spend about two months there, still fine tuning the basics of beekeeping that they have been practicing for over 40 years.

The mission of this part of the

Richard Adee examining breeder colonies looking for the right aged larvae for grafting, points out one of his breeder queens.



Adee operation is straight forward - bring colonies from California after pollination, divide, requeen and move north for honey production. A simple plan that requires understanding the complex biology of queen production on a massive scale, requeening with queen cells that are all in good shape, providing mating yards that can accommodate hundreds, perhaps thousands of queens - all on the same day - insuring queen acceptance and quality, and all in the span of between eight and ten weeks.

Late last fall when the majority of Adee's South Dakota colonies were heading west to California, two loads went south to Woodville, Mississippi to spend the winter. They will be the center of attention come spring because from them will be chosen the queen rearing colonies -

Grafting involves removing the two day old larva from the cell in the frame into one of the plastic cells on the queen cell bar.



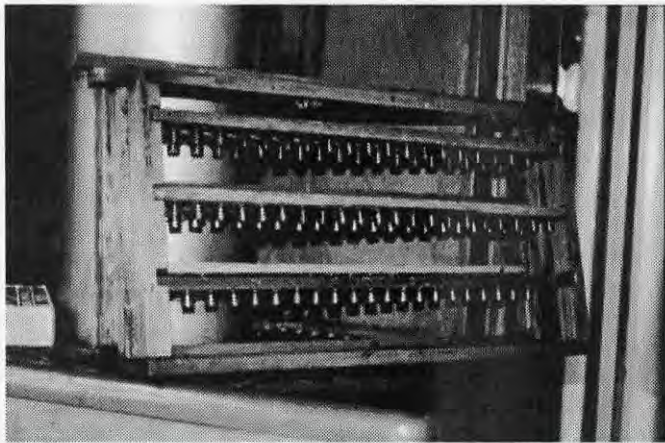
starters and finishers and breeder support colonies - used beginning in March.

When petal fall in the almond orchards is complete in early to mid March, Bret Adee (see *Bee Culture*, March 1999), begins sending colonies to Mississippi. About 12,000 are sent south, two or three truckloads a day until all 22 loads arrive. The queen cell production area has already been setup, the crews have arrived from South Dakota, California and Nebraska, the weather has finally turned and it's time to get started.

This entire operation is a well choreographed dance with several parts. One is the production of queen cells. One is making nucs, then splits. One is queen mating, one is checking for queenless colonies and requeening if necessary, and finally, the last is once again moving - this time back to South Dakota. They are all going on all at the same time, and each relies on the rest to be correctly done and on schedule.

As mentioned, two loads arrive in Mississippi in the fall and Bob Adee, Richard's brother, comes down with them and stays the winter (if you can call southern Mississippi weather winter). In early spring the colonies are evaluated and finishers and starters and breeder colonies are selected and moved to the queen yard.

The queen production area sits on a leased piece of land two or so miles out of the tiny town of Woodville, which is about 45 minutes due north of Baton Rouge, LA. Adjacent to the queen area sits the boyhood home of Jefferson Davis, now a museum and available for tours. Adee's have been using this area since 1957.



Frames, each with three queen bars that hold 19 queen cell cups, ready to be placed in starter colonies.

The colonies finally chosen for the starter/finishers are set up in six colony units. There is one, three story starter colony and five two story finisher colonies per set. There are also about a dozen colonies set up to house the breeders.

Breeder queens are selected from homegrown stock or are purchased. When the Hybribee program was going strong the bee of choice was Starline. Now Adees are selecting from their own stock which is primarily a Starline derivative. They also try, on a small scale other breeders from outside sources. This gives them opportunity to improve their stock and to mix different genes into the population to avoid inbreeding.

Frames of just grafted cells are placed in the starter colonies. Some frames have two bars, some three. Total is 190 cells/ starter colony.



A six colony starter/finisher unit. The starter colony is in the back, on the right. The grafted queen cells are placed in the upper box, which is moved over the bottom two boxes, now separated by a queen excluder. The other five colonies, two on the left, two on the right and one in the rear, are the finishers.

Grafting is done by Richard and Kelvin in a small trailer that's moved to the queen area each spring. The trailer is stored in the 5000 square foot warehouse in Woodville the rest of the year. An external generator provides electricity for light and refrigeration.

Both Richard and Kelvin use a grafting tool that originated in China that has a flattened, curved scoop on the end for picking up larvae and some jelly, and a retractable-pen-like device that easily, and gently slides the larvae off the end when putting the larva in the cell. The plastic cells are made by Jzs Bzs and

are tinted gray for better visibility inside. Nineteen plastic cells fit on a bar, and each cell-holding frame is capable of holding three bars. When Richard has a good frame of larva to choose from he can graft 19 cells in about two and a half minutes. He says Kelvin is faster.

Each starter colony is set up the same way and holds four cell-holding frames (see drawing). Two frames have two 19-cell bars, and two frames have three 19-cell bars for a total of 190 cells/ starter colony/ grafting session. There are two groups of starter colonies used in rotation, with 10 in each set up, so

After 10 or 11 days capped queen cells are removed from the top notch in the finisher colony frame. Then, the two remaining bars are moved up a notch, leaving the bottom notch open and ready for the bar from the starter colony tomorrow.





Ripe queen cells are removed from the bar and placed in a pan covered with a towel. Counts of good and bad cells are made.

at each grafting session 1900 larvae are moved (19 cells/bar X 10 bars/ starter colony X 10 starter colonies = 1900 cells/grafting session).

Starter colonies are rich in young bees, as are the finishers, and are reinforced or reconfigured at least once a week to maintain the young population. The starters are three stories high. Two are below a queen excluder, one of which has open brood, and the one above holds the queen cell cups.

Grafting is done five days a week - Mon., Tues., Wed., Fri. and Sat. (so the crew has Sunday off) - from about 3:30 in the afternoon until 6:30 or 7:00. Completed frames of grafted cells are put in the top story of the starter colony and left for 36 hours. This is enough time to amply feed the larvae and begin drawing out the cells.

After 36 hours (for instance if cells were grafted on Mon. afternoon, 36 hours later would be Wed. morn-



Tom DeBore (R), one of the crew leaders, points out unloading locations to Richard early in the morning, before sunrise.

ing), the bars containing cells are moved out of the starter colony into the finishing colonies.

Each starter colony has 10 bars of 19 cells each. Two bars (38 cells) go into each finisher colony. Each finisher colony has two frames that hold these now-started bars, and each frame holds three bars.

When bars are moved out of a starter colony, each individual bar is taken out of the frame in the starter colony and put into an identical frame in the finisher colony, and each goes in the same position in the frame - on the bottom row. The bar in the top row has been in

the finisher long enough that the capped queen cells can be harvested, so the bar is removed and the cells harvested. This leaves the top position open so the bar in the center is moved up to the top, the bar that was on the bottom is moved to the center and the new bar is placed in the now-vacant position on the bottom. This bottom position, Richard feels, is the richest in young bees and closest to the food in the colony, thus gets the most, and dearest attention. As cells mature they require less attention so can be a bit further from the action in the brood nest.

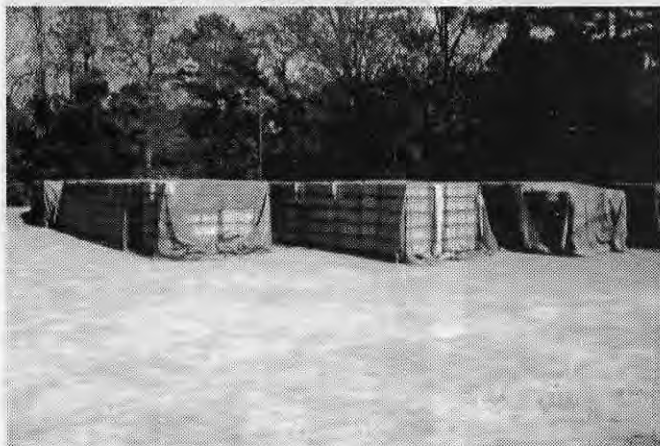
With the two days a week cells aren't grafted, and harvested, the time a two-day-old larvae is under manipulation is:

- 3 days as an egg
- 2 days as a larva before grafting
- 36 hours in the starter colony
- 8.5 days in the finishing colony
- Total - about 15 days
- (queens emerge on the 16th day)

Of the 1900 larvae originally grafted each day, about 1700 (90%) are accepted and moved to the finishers. Another 200 don't make that cut, down to about 1500. Of these, 92-95% (1380-1425) survive to produce honey in South Dakota. That's a 72-75% overall success rate. Not bad by almost anybody's standards.

This is also the time the finisher colonies are evaluated for their ability to raise queen cells. Each is examined by the condition of the cells harvested. Some fail during the month long process and are replaced

Empty equipment, ready to be used for nucs, arrives from CA and is stacked outside, covered.



Trucks arrive from California, heavily netted, ready to unload early in the A.M. "There are several outfits that specialize in moving bees long distances now, with special trucks, their own nets and skilled drivers, that didn't exist 10 years ago," Richard said. "We couldn't do this without that service available."





Prepared boxes are brought to the area where splits are being made. Boxes are loaded the night before.

or requeened. Others have other problems that need attention. This inspection also spots the fact that a queen either emerged early (and chewed the rest of the cells), or that the excluder is leaky and the regular queen moved up (and did the same thing).

Most of these problems can be prevented during the once a week brood switch, where sealed brood is moved below the excluder, and open brood moved up, surrounding the frames with the queen cells. This, Richard feels, keeps the youngest nurse bees in the vicinity of the cells. Brood frames that are moved up are placed so that sealed brood is toward the outside of the box, while eggs and unsealed is toward the center. Also during this inspection both finishers and starters are inspected for stores and if needed



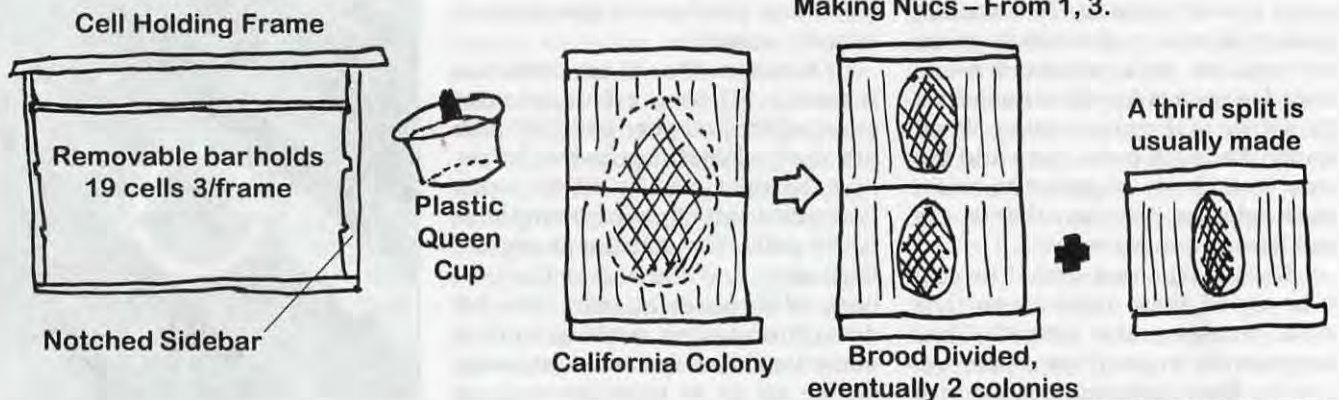
Some five-frame nucs are made to be used later to requeen those splits that lost a queen. Some are moved north.

pollen is added. All this rearrangement also precludes the pressure to swarm, which increases as spring progresses and the population builds and nectar and pollen accumulate. To accomplish this examination and reorganization of every frame of all 140 colonies (starters, finishers, breeders and extras) takes two experienced people four to five hours, two days a week. Consistency in brood placement, queen evaluation and stores buildup are critical to avoid swarming and keep these colonies producing healthy queen cells. The stress on these colonies is incredible.

Harvesting queen cells is fairly labor intensive and requires four people. Two go though each finisher colony and remove the frames with the queen cells. From each frame the top cell bar is taken out and placed on top of the remaining frames. They then move the two remaining bars in the queen cell holding frame up a

notch, leaving the bottom notch open (and ready to receive the next set of grafted queen cells from the starter colony). A second person moves the bars with the queen cells from the colony to the person who removes each cell from each bar, counting the good ones, and discarding the unacceptable cells as he moves along. The whole process takes a little less than an hour. The cells are removed in a heated pickup cab if the weather is cool, and placed in a large pan covered with a warm towel. This has proved more than adequate for the short time they are exposed to the outside world before they are placed in a new colony.

All the while the queen rearing has been going on, the rest of the crew has been doing the real work (or that's what they told me). They are responsible for orchestrating the arrival of the trucks from California, getting them to one of two unloading areas on time, and then getting





Once complete, each nuc is plugged with a small piece of screen.



Completed nucs are left to sit overnight if they were on the pallet, but newly made nucs are hauled out to a beeyard that same day.

them unloaded. These areas deserve mention. One is a piece of land owned by the Adee operation and is called the 'load out' area. It can comfortably hold five or six semi loads of arriving bees. It has a loading dock which was used extensively when bees were unloaded with a motorized two-wheel cart and colonies were not on pallets. Bob Adee has a trailer on this spot and this is where he spends the winter. Another trailer for the crew and a small pond make this a scenic and enjoyable place to spend time.

The second spot is an old Army base, Camp Van Dorn, now owned by a local farmer. It is about 1000 acres and is crisscrossed with paved roads (even though the roads are 40 or 50 years old, remember that frost does not cause its typical problems here, so they are in relatively good shape). It is absolutely ideal for this operation. It has easy access for trucks and an almost unlimited number of unloading spots. To unload, a truck will pull to the middle of an intersection and pallets are unloaded in each of four directions from the center of the intersection. When empty the truck pulls away and the crew has plenty of space to work, stack colonies, drive up other trucks and load and move away.

Now, for the real work. The goal is to divide these colonies so they are all nearly equal in strength. They are generally in good shape when returning from California, loaded with

almond pollen and nectar or honey. Since the bees were treated for mites, fed protein and HFCS before moving into the almonds they usually don't need any nutritional attention. Moreover, it is spring in Mississippi and there are nectar and pollen sources available. Feeding is not an issue. However, on arrival colonies are immediately given a dose of terra and an entrance reducer is placed in the entrance.

The actual process sounds simple enough. Each colony comes to Mississippi as a two-deep unit. The goal is to divide the unit's parts - brood (open and sealed), bees and stores into at least two, or better three, and maybe even four units. The average is three. The standard 'nuc' is one frame of open brood, one frame of sealed brood, one, maybe two frames of bees and one frame of honey plus the remaining frames empty. During all this the queen is found, and killed (about 75 - 80% are found and killed in the time allotted for each colony).

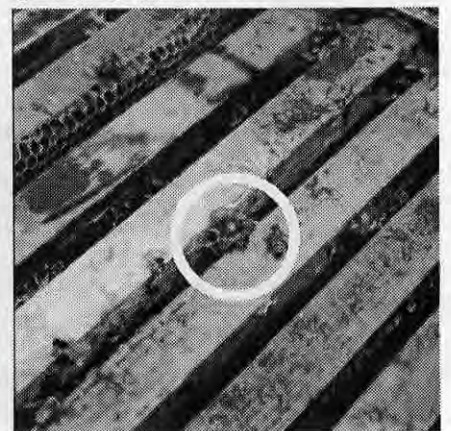
Of course it's not as simple as it sounds. There are four colonies on a pallet, and very often all four are open, sometimes more, to get just the right mix for all the nucs that will eventually come from these larger units. The diagram shows the beginning, and the end of the process. With an eight man crew all doing this at once, working on over 400 colonies per semi load, and with maybe 50 or so hives all open at

once, all being disturbed at once, and with the remaining hives either having just been worked or getting their bearings after having been unloaded, foraging or making orientation flights, the chaos is unimaginable. Standing in the center of one of those intersections is like standing next to a huge waterfall. The incessant noise is louder than anything you can imagine coming from a creature as simple as a honey bee (or millions of honey bees, actually). That eight man crew can manage between 320 and 350 California colonies in an eight hour day, by the way, which comes to about ten minutes per unit. An interesting note here. Inclement weather is favored for this activity, rather than warm, sunny conditions. This weather keeps bees at home and making these splits is actually easier because fewer bees are out foraging or flying and it is easier to determine the exact population of the colony, plus fewer drift or get lost during the confusion.

Obviously experience counts with this task. Newer employees are guided by the more experienced and it usually takes a season or two to get a feel for how this works, and to become as close to 100% consistent as possible.

Once the separations have been made, with brood and stores all in their respective boxes they are re-assembled into two story units and left to sit overnight. This allows the bees to more or less equally divide themselves to cover the brood in each box. New units, those that were created from the original colonies are kept as singles and moved that same day to mating yards. Screen is stuck in each mouseguard entrance

A queen cell is placed in the center of the brood nest in each nuc two to four days after being queenless.



overnight to keep everybody at home.

The next day another eight or 10-man crew divides the two-deep nucs into singles (splitting down the middle they call it) adding tops and bottoms and they, too are moved to mating yards to be requeened.

These now-queenless nucs are moved to mating yards all around the county. Yards are not yards in the traditional sense. Large pastures are found, and nucs are placed on the outside edge of these, next to the tree line. They are placed on the ground six to eight feet apart, with entrances facing in random directions. A large pasture may hold several hundred of these units. They are left there for three to four days, queenless. They are not on pallets, but individual bottom boards. This arrangement means a lot of manual labor loading and unloading each unit, but the configuration leads to nearly no drifting, of bees, or eventually the queens on mating flights. It has proven very successful for mating.

By the third or fourth day each unit has come to the conclusion that it is queenless and begins preparations to requeen itself. That is exactly when a queen cell is added. Coordinating the exact number of colonies that need cells in each yard, with the number of cells produced each day requires exact record keeping. You can't afford to miss a yard.

Mating takes place after the queen emerges from the cell and spends a few days getting oriented. There are no beekeepers in the area, so any drones in the area are from Adee's colonies. Drones are fairly common in these colonies, since protein was fed in California and both pollen and nectar were in abundance in the almond orchards. Thus, drones are from last year's queens, and since breeders are chosen rather carefully, the mating is pretty well controlled. It is a system that has worked and that Adee's are comfortable with.

At the same time that these full size units are being made up, several hundred five frame nucs are also being made. These are treated like the rest, moved, given a queen cell and set in a mating yard. They will be used later.

These units sit in these yards all of April. By the third week of April

Nucs are set along the edges of large pastures, six to eight feet apart facing random directions.



all the colonies have arrived from California, all the nucs have been made, all the queens have been raised and the next step begins.

Each colony is checked for a queen. Queenless units are joined with one of the five framers made earlier so it has a mated queen. Then, each colony is again handled when it is picked up, loaded on a truck and returned to the holding yard. Bob Adee has mastered a somewhat better way, at least in his opinion. He brings a bobcat to the yard, loads an empty pallet and has this move along with him as he places a colony on it. When full (four colonies/pallet) it is loaded on a truck. This way a colony is only handled once, rather than twice. The younger people still handle them twice.

These colonies are then loaded on semis and head out to South Dakota for honey production. Some go to Nebraska, some of the five frame nucs are used up north or sold, but none stay in Mississippi.

Thus is accomplished arrival, division, queen rearing, requeening, mating and moving. The biology is straight forward, the labor kept to a minimum and colony health and strength built to a maximum for production later in the season. But of course there is more to this than simple beekeeping. There are those

20 plus employees that do the work.

Adee's purchased a large house, with a sizable lot years ago. The six bedroom house was refurbished to accommodate up to 15 people. It has three bathrooms, a small yard, and in the back three trailers for those with families who come south to enjoy the weather and the company. Breakfast food is available, but it's fix-it-yourself, lunch is packed (supplies are available) and supper is fixed by a person who comes in and cooks. Kitchen duties are handled by each person in rotation, so each gets to clean up about once every two weeks. There are washers and dryers available, a television, and a basketball court (kind of) in the parking lot.

The details of pay checks and banks is not as complicated here as in California because Adee's have established a reputation in the community and, in fact, are the second largest business in the county.

Once all the colonies are moved the house is closed up, the warehouse is shutdown, the trailer moved and things settle back to normal in Woodville, Mississippi. But it gets hectic in Bruce, South Dakota, as trucks arrive on a schedule that allows each load to get unloaded, moved, fed, medicated, and supered for the honey flow. But that will wait until next time. **BC**

Swarm Prevention

The last minute is not always too late.

Richard Bonney

Swarm season is here, but we are relaxed. All our preparations are in order – hive bodies have been reversed, splits and nucs have been made, supers are on – we're ready. Our hives are not going to swarm. Hah! Many's the time I have been in this situation, and then one day discovered that the unthinkable has happened. Despite all of my preparations, one (or more) of my hives is on the verge of swarming. Bees are thick around the hive, foraging is at a low ebb in spite of the plethora of nectar plants in bloom, while inside the hive, few eggs are to be found, and queen cells are ready to be capped.

Just to refresh our memories, what does each of the foregoing indicators tell us? First, a large number of restless bees hanging out around the hive under good nectar gathering conditions is a sign that swarming may be imminent. (It may mean other things, too, so don't jump to conclusions. Look for other signs as well.) Some of the bees are engorging on honey, or have engorged, and are waiting for someone to make a move toward leaving. Then, we know that the swarm normally emerges on or about the day that the first queen cells are capped. The presence of cells mature enough to be capped should be worrisome. Are they going to be capped today, tomorrow, when?

Finally, we also know that the queen stops laying about three days before the swarm emerges. Few eggs present suggests that we are near the end of that three-day period, and probably the swarm is about ready. Eggs standing on end are fairly fresh, and we have a little time left. Eggs lying down are on the verge of hatching, and again, time is running out. What should we do?

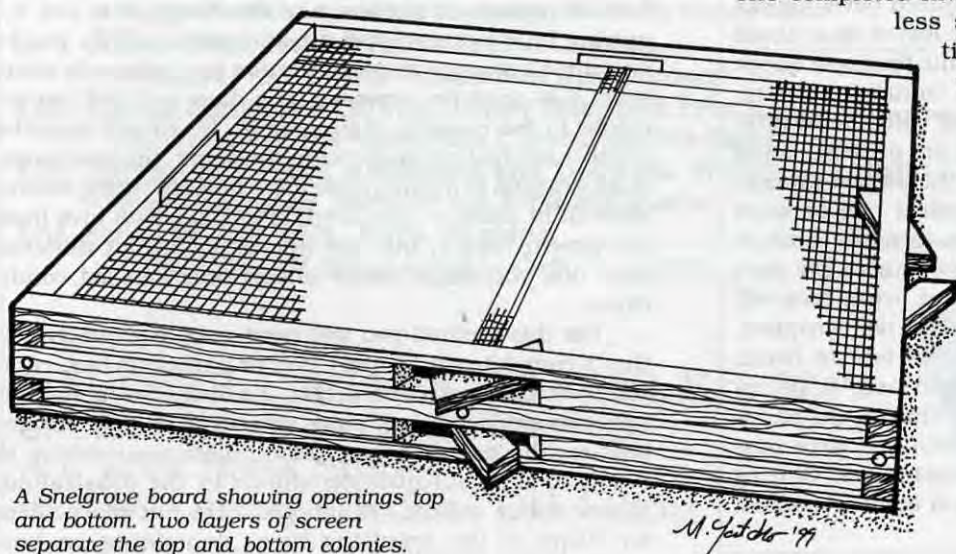
First, we must recognize what will *not* work. When we see the signs just listed, it is very late in the swarm cycle that has been going on for several weeks. That very real phenomenon, the swarm impulse, has set in. The bees are going to swarm no matter what. Cutting queen cells, adding more supers, reversing – these will not work at this late date: They do not satisfy that swarming impulse. To stop them from swarming, you must make the bees *think* that they have swarmed. There are several ways to do this. Let's take a look at a couple of them. Neither is difficult, but they do require some extra equipment and some hive manipulations. Let's look at the first method. It is perhaps the simplest, but it requires that you be there at just the right time.

For equipment you will need only two extra pieces, a queen excluder and a Snelgrove board. The queen excluder is familiar to everyone, the Snelgrove board may not be. It is a frame the size of an inner cover with screening top and bottom. It has six (maybe eight) built-in, closable entrances. These entrances are paired top and bottom so there are three (or four) sets. As will be seen, you will need one of these entrances for this prevention method.

Assuming your hive has two hive bodies and probably one or more honey supers, arrange it as shown in the illustration. We are ignoring the honey supers in the illustration, but when you are done with your manipulations, if any supers have been on the hive, replace them on top as is usual. If the lower hive body is particularly crowded when you finish, place one or more supers on top of it.

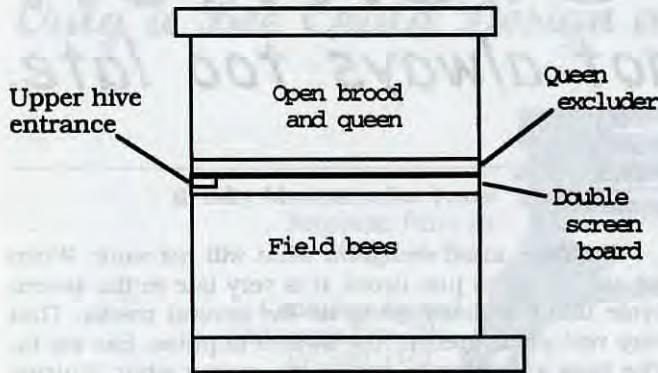
The completed hive configuration will be more or less standard except for the insertions. Starting from the bottom, we have the bottomboard, a hive body, a screen board, a queen excluder, the second hive body, and the covers. Any *Varroa* sticky boards and screens may be kept in place during this manipulation.

The point of the hive manipulation that we are undertaking is to make the bees believe that they have swarmed. We do this by ourselves first recognizing a pair of long-known but perhaps little-practiced precepts of beekeeping: 1) A colony deprived of all or



A Snelgrove board showing openings top and bottom. Two layers of screen separate the top and bottom colonies.

Supers may be placed over either body as required



PREVENTION METHOD 1

most of its brood will not swarm, and 2) a colony deprived of all or most of its field bees will not swarm. We will work to bring about both of these conditions, thereby making the bees think they have swarmed.

PREVENTION METHOD 1

To actually bring about the configuration shown, move aside the upper hive body so that you have ready access to both, and start switching frames. It is helpful to have an extra empty hive body on hand as an interim

Cutting Cells

Cutting queen cells is a time-honored method of controlling swarming. Unfortunately, it is not a reliable method, especially when done at the interval often suggested - every two weeks. This interval is based on the queen's development time of 16 days. Cut every two weeks, so the thinking goes, and a new queen will never mature.

We need to look closely at queen development during a swarm cycle. The swarm leaves on or about the day that the cell containing the first new queen is to be capped. This is the cell containing the replacement for the queen leaving with the swarm. If that cell, and any others that are present, is cut before it is capped, it will slow the swarm process but *not stop it*. The bees will select one or more larvae of proper age, and begin to raise them as queens. Since these larvae will be four to five days along in their 16-day development cycle, they will be only three to four days away from being capped, at which time the swarm will feel free to leave. This means that queen cells would need to be cut every *three* days to be effective. This would be totally disruptive to the colony, even if it were possible within the schedules of most of us. Cutting queen cells is not a viable swarm control method.

repository for frames as you work. First find all of the brood frames. Destroy those queen cells you can find. The bees will probably destroy any that you miss once they recognize their new status. Place the brood frames with their attendant bees, and the queen, in what is to be the upper hive body. Include here a couple of frames of stores. If there are too many brood frames for one box, place some capped, ready-to-emerge brood in what is to be the lower hive body. (Look for capped frames with bees actually beginning to emerge.)

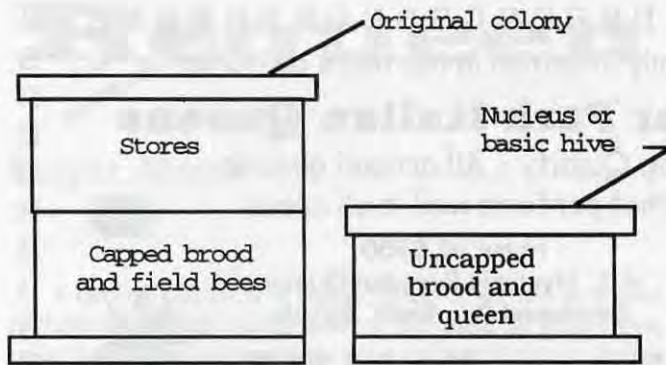
Place the bottom hive body on the bottomboard. By default it will contain the field bees since they are oriented to this location and entrance. (Do not change the hive location during this manipulation.) Next, place the screen (or Snelgrove) board, and then the queen excluder. If there are multiple entrances in the screen board, close all but the one on the upper side in the rear, so that the upper and lower entrances are at opposite ends of the hive. Bees will enter and exit the top box through this opening and up through the queen excluder. There should be no access between the upper and lower hive bodies.

With these two pieces of equipment in place, set the second hive body on top of the queen excluder. It will contain the queen and the *uncapped* brood. Put in place any supers and the covers. The hive, although not completely separated, is now two colonies. It will look as depicted. The lower colony has been deprived of all or most of its brood, and its queen. The upper colony has been deprived of its field bees. Neither colony will be inclined to swarm. For insurance, we have set it up so that the lower colony has no queen and no resources from which to raise one, and the upper colony, if it still has any inclination to leave, cannot, because of the queen excluder.

After a week or so, the bees in both of these colonies will have accepted their new status. The swarm impulse has been satisfied. They will "think" that they have swarmed. You may remove the double screen and the queen excluder, restoring the original colony. There should be no problem with reuniting since the separation has been relatively short, and pheromones have been shared through the double screen.

This method, as stated, is one you can use if you find the colony on the verge of swarming. It is one requiring little extra equipment and which allows you to revert to your original configuration in a relatively short time. It is good for someone who does not wish an increase in the number of hives kept. Now I will describe another method you may use in the same circumstances, or as a means of making increase while practicing swarm control. In essence, you are taking a nucleus hive from the parent colony, but the nuc is somewhat different from one you might make under more relaxed conditions.

For this method you will need more equipment, either a complete single-story hive or a nucleus box, complete with frames. The larger the nuc, the better (or take two smaller nucs), since you want to make an impact on the parent colony. Manipulate your colony to result in the configuration shown in the illustration. Again, honey supers are ignored here but place them on either of the resulting hives depending on how crowded and active they may be.



PREVENTION METHOD 2

PREVENTION METHOD 2

Once again, we have a situation where from one of the resulting colonies, all or most of the brood has been removed, and from the other, all or most of the field bees have been removed. Neither should swarm. We have further reduced the probability of the parent colony swarming by removing the queen. Now, what are our options for the future?

If increase is in your mind, take the hive or nuc

which you have set up, give it its own stand, and you have a new, albeit somewhat weak hive, since its resources were not balanced when it was set up. It will work, though, assuming the season is not too far along. The parent colony needs a new queen, of course. They do not have the resources to raise one themselves, and even if they did, the elapsed time until that new queen is fully functional is too long. Buy a new queen.

If you don't want to make increase, you have two options. Sell the unit, recognizing that it is somewhat weak and has an old queen, or combine it back into the parent colony after a couple of weeks have gone by and any thought of swarming has dissipated. The possibility of combining back is the reason that the nuc has been placed back-to-back with the parent colony. It could also have been placed on top of the parent. Either way, the bees from the new unit will have little trouble re-orienting to the parent colony.

Both the parent methods described have variations. It's that old saw - if you ask five beekeepers a question about bees, you will get back five answers, all different and all correct. If you have a potential swarming situation developing, think about these preventive actions and do something, but do it quickly. After they swarm is obviously too late. **BC**

Richard Bonney is the author of several beekeeping books and a regular contributor to these pages.

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Requeen Anytime!

Roger Morse

I cannot think of a single piece of advice or a new technique or tool publicized in the past 50 years that tells me how to better requeen a colony than my father taught me when I was a teenager. However, there have been a great number of excellent papers, supported with statistics, that tell me why I should requeen each year. And, I have a better understanding of why things go wrong because of research on the subject. However, when I requeen my own colonies, I use the same methods I have used for the past 60 plus years.

I rarely raise my own queens though I am increasingly encouraging beekeepers to do so. I usually buy caged queens, accompanied by five or six workers in the cage, that are shipped to me through the mail. I have found no differences in queen acceptance among the various wooden and plastic queen cages that have been developed.

HOW I REQUEEN

To introduce a new queen, at any time of the year, I use the following technique. I first select a frame that is about half-full of mostly capped brood from a strong colony. I place this frame and a frame that is half- or two-thirds full of honey side by side in the middle of an empty super. I place this super on the top of an old-fashioned wooden inner cover that has the hole in the center covered with two pieces of window screening, one above and one below the hole. These two pieces of screening are far enough apart that the bees in the two units cannot feed or contact each other. I cut away an inch-wide piece of the top of the inner cover rim so as to make an entrance for what will become a new colony. I make this entrance on one side, not in the front of the inner cover, so that the flight from the new colony will not interfere with the flight of the parent colony below.

The bees on about four frames from the center of the brood nest of the parent colony are shaken into the super. I shake bees from the brood frames because they are most likely to be young bees, and they will do a better job of feeding and protecting the new queen than will older bees. If the frames of brood and honey I take are covered with bees, I need to shake fewer bees into the new unit.

In the next step, the queen cage, candy end up, is placed perpendicular between the frame with the brood and the frame with the honey. In this way the screened face of the queen cage is fully exposed to the bees in the new colony. The super is filled with empty combs, and the cover is put into place. This new colony, with the inner cover from the colony below as a bottomboard, is placed on top of the colony from which I took the two frames containing the brood and the honey. While the bees in the two units cannot feed one another, heat

from the larger parent colony below will rise into the new colony above.

I also use this technique to grow a new colony or to remove brood from a strong colony as a swarm control measure in the Spring. This method of making a new colony works any time of year and under a variety of weather and honey flow conditions. I prefer to make up new colonies only from strong colonies. I place two dark and drawn but empty combs in the center of the brood nest of the colony below the inner cover to replace the two combs raised above. This relieves congestion and gives the queen below ample room in which to lay for several days. It is a good swarm prevention technique.

I am very much aware that many of the older bees in the new colony will take flight and drift back into the parent colony. However, I am just as glad that they do so since these are the older bees that are more aggressive toward a queen that is foreign to them. New queens can be damaged and have parts of their legs and antennae removed by older, biting and aggressive bees. Young bees do not recognize if their queen is young or old, foreign or not, (usually) and treat all queens kindly. If I make this introduction on a cool day, or if there is a light rain or mist, I may not add so many bees to the new colony because fewer will drift back because of the weather. It is also possible to stuff some green grass in the entrance of the new colony to delay flight for a day or so. Green grass will dry out, and the bees can remove it after a day.

FINDING THE OLD QUEEN BEFORE SPLITTING

I prefer to search the parent colony and to find the old queen before splitting out the brood, honey and bees to make a new nucleus colony. It is the safest way, but it is also time-consuming. I am aware that many beekeepers who use the technique I am describing look

Make sure the candy is soft, and the bees can get through.



over the frames of bees to be removed, and if they do not see the queen, they proceed. That is certainly the fastest, but it is dangerous. If the old queen is not seen and is accidentally placed above the inner cover, the young queen will probably be killed. While the colony below will rear a new queen, it will be weakened in the process and probably not be a honey producer that season. In other words, there is no good substitute for finding the queen in the parent colony.

REMOVING QUEEN CAGE SUGAR CANDY

We know that bees in a new nucleus colony lose the memory of their old queen after about 24 hours. Thus, the new queen should not be released from her cage in less than a day. However, our goal is to get the queen released as soon as possible after 24 hours and to force the new colony to start brood rearing. We also prefer to have the bees release the queen, not for us to reenter the colony to do so. Young queens are more nervous and are more likely to be balled if we disturb the colony too much. When they are disturbed, worker bees older than about two weeks of age will sometimes bite and cling to a queen not their own. This is called balling; balling is not necessarily a killing process, but queens may lose feet, legs and/or antennae while they are being held.

I like to leave about one-third of the candy in the queen cage, but I usually poke a small nail through the candy to facilitate the bees eating it away in about 24 to 36 hours. Queen cage candies vary in their hardness, and thus the rapidity with which bees can remove them varies, and that makes giving advice on how much sugar candy to remove difficult. As I mentioned above, the candy end is placed upward. If any of the worker atten-

dants in the cage die, they will fall downward and not block the exit hole.

CHECKING THE NEW COLONY

I like to check the new nucleus colonies about five to seven days after the new queen is introduced. I look for eggs, make certain there are enough bees to cover the brood, and that is all I do. I keep the colony open for as short a period of time as possible because young queens are easily disturbed and balled.

THE NEXT STEP?

Assuming you made the nucleus colony in the early Spring, you may now proceed in one of two ways. You may lift the nucleus colony off and place it onto its own bottomboard, and it will grow to be a new colony that will produce honey the following year. Or, you may use it to requeen the old, parent colony from which the bees and brood were taken.

If you wish to requeen the old parent colony, you wait until about a month after you make the new colony. At that time you search the parent colony for the old queen, kill and discard her. It serves no useful purpose to leave the body of the dead queen in the hive so that the bees know when she is dead, though I am aware that many beekeepers have said this is helpful. There are no data to support the idea that this procedure has any merit.

You may make the job of finding the old queen easier by placing a super of drawn combs on top of the parent colony, and under the nucleus colony, about a week or 10 days before hunting for the old queen. After the new super is in place, the queen will usually move upward into it and lay eggs. In this way, there will be fewer

by Dan
Hendricks

Requeening With

Requeening is straightforward and assured if one utilizes a Thurber Long Cage (see below).

First, find the current queen, catch her in a queen catcher (listed in many catalogs), and release her into the cage. Usually several workers will be in the catcher with the queen, so lay a cloth across the top of the opened hive, release the queen onto the cloth, shake the bees out of the catcher, and recapture the queen alone. With an end plug removed from the cage, insert it into the opened catcher. Block the queen's escape with your fingers. Remember, queens don't sting people, only other queens. Now hang the cage between two frames to return her to the hive. The bees will continue to get enough of her pheromones to remain contented, and probably will not be induced to start queen cells. There is no hurry about caging the old queen. If you don't find her the first time through the frames, reverse and go back to the beginning. (Set the first frame removed in an empty hive body so there is a space between the frame already examined and those yet to be examined. Removing frame number two first is usually easier because the end frame is often stuck to the side of the hive.) If necessary, close the hive and try again tomorrow.

As a last resort, set the hive to one side, place another hive body on the bottomboard, and cover it with a queen excluder and an empty hive body. Then shake the bees off each frame into the hive body, watching for the queen to be strained out by the excluder.

Second, order the new queen and determine when she will be available. Remove the old queen at least two days before the new one is due to arrive. (You know right where to find her, right?) By then all the bees will know

they have no egg layer in the hive and will be delighted when a new one magically shows up.

Third, transfer the new queen into the Thurber Long Cage from the shipping cage. Do this in a closed room with an outside window, so if by chance the queen escapes you will be able to recapture her. This is a good time to mark her. (Marking kits are listed in many catalogs.) You will be happier using only white or yellow to mark the queen because the darker colors are less helpful in locating her during later inspections. Use fast-drying lacquer or correction fluid or nail polish; the former is available from automobile dealers.

Fourth, install the cage between two frames of drawn comb — not foundation — after spreading them enough to permit easy entry. Now the advantages of the Thurber cage become apparent. The bees can contact

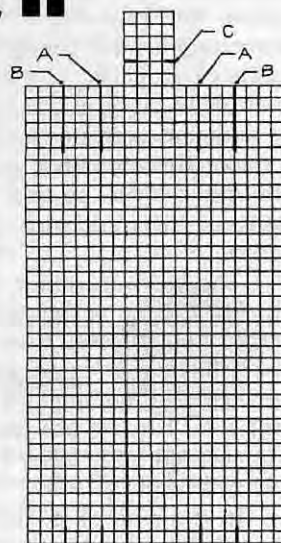


FIG. 1



FIG. 2

bees and less congested circumstances under which to search for the queen. After killing the queen, you remove the inner cover and substitute a single piece of newspaper with four to six long slits cut in it. The bees will remove the paper over a period of 24 to 36 hours, thus bringing the bees in the two units together slowly. There will be almost no fighting between the two. The new queen will usually be accepted, and the colony is requeened. I have had a high success rate using this technique.

FALL REQUEENING

If you wish to increase your colony numbers, you may split out a nucleus colony in the Spring, and allow it to grow to maturity. You may then split out a second nucleus colony in July or early August, and requeen the old colony using the technique outlined above in late August or early September. This usually has little adverse effect on honey production by the parent colony. The earlier this is done in the Fall, the better, as the young queen has more time to rear the young bees needed for Winter.

THINGS THAT DO NOT WORK

Several shortcuts to the above method of requeening have been suggested. Some of these work sometimes for a variety of reasons. If there is a moderate or good honey flow, however, you can do several things that you cannot do at other times. During a honey flow bees pay less attention to guarding and protecting their queen. For example, what happens if one places a queen cage with a new queen in a colony with an old queen? The answer is that the new queen is killed by the workers. Honey bees recognize their own queen for

12 to 24 hours after she is removed. If a new queen is introduced while the old queen is present, she is recognized, by odor, as being foreign.

It has been suggested that you might place ripe queen cells in a colony you want to requeen, and that the new queen that emerges will take over the colony. There have been three good research studies on that question, but the success rate is too low for the technique to be recommended.

Dunking queens that are to be introduced in honey is said to make an introduction easier, but there are no data to support that suggestion. Likewise, using excessive smoke on a colony to confuse the bees has been suggested as a requeening help, but in practice it does not help, and the success rate is low. Driving the bees out of a colony and onto the ground with a repellent, finding and killing the old queen and substituting a new one has been suggested, but beekeepers report that the success rate is low with that method, too.

REMEMBER. . .

- Honey bees recognize their own queen and can tell the difference between their queen and one that is foreign.
- If bees lose their queen, they lose their memory of her after about 24 hours.
- Young bees, probably those under about 10 days of age, pay little attention to their queen, and usually do not know one queen from another.
- Bees must have antennal contact with a queen to recognize and feed her.
- Wire screening with about 14 wires per inch appears to be as small as can be used on a queen cage to have a queen be fed and accepted.
- If a finer screen is used, the bees recognize a queen is present but they cannot feed her, and they usually ball and often kill her when she is released. **EC**

The Thurber Long Cage

the queen only when she walks over to one of the edges. If any bee takes umbrage at her presence, all she has to do to protect herself is take a step back into the middle of the cage. But when she comes to the edge to be fed, the bees pick up her pheromones and spread them throughout the hive. One can exercise an extra measure of caution before inserting the cage by going through all the frames to be sure no queen cells have been started, but this step will be repeated later anyway.

Fifth, after a couple of days, withdraw the cage, remove one end plug, and release the new queen onto the top bars. Do not let bees get into the cage or she may not come out for a very long time! By now all the bees in the hive are familiar with her pheromones and will accept her immediately.

Sixth, do not disturb the hive for as long as possible but check it frame by frame 10 days after the old queen was caged or after the last previous check. Expect to find that some queen cells have been started.

Making A Thurber Long Cage

First, cut a piece of 1/8" - eight spaces per inch - hardware cloth as shown. Count the spaces to get the width, but the length can be longer or shorter. Mark the fold lines A, B and C with a felt-tip marker.

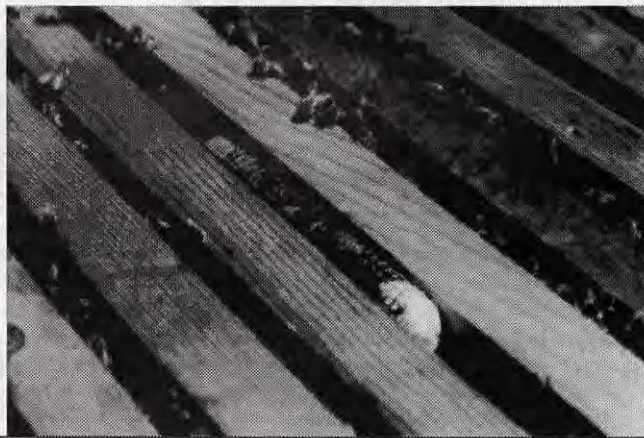
Second, bend up the two sides about 45 degrees along bend lines A. (A vice grip "sheet metal tool" makes this easy.) Then bend the outer edges up 90 degrees along bend lines B. Those wires marked as fold lines should *not* be part of the bend; they should be part of the adjacent flat surfaces. Now continue the bends on lines A to 90 degrees by hand. Notice that the two edges do not come

together; this is deliberate. Secure the top and bottom corners with a drop of solder or epoxy.

Third, saw from a piece of 1 1/2" x 3/8" wood lath (or equal) two end pieces as shown in Figure Two. Whittle these to fit snugly in the open ends of the cage. They must be snug enough that the bottom one is not pulled from the cage as it is being withdrawn from between two adjacent frames.

Fourth, bend down 90 degrees along bend line C. This is the handle which rests on an adjacent frame top bar to support the cage in the hive.

A cage using a candy plug instead of wood.



Newsletter Quality

What makes the good, good, and the bad and ugly so common?

Kim Flottum

What makes a good newsletter for a beekeeping association? Are the requirements the same for newsletters for Emergency Room Doctors, Landscape professionals, mountain bikers and beekeepers? Are there some fundamental requirements for each of these, or are they all different? Or are they all the same?

There is a sameness in that information is given *from* a source *to* a group of readers who want or need that information. And, even though sources, topics and detail vary, the *from* and *to* don't. For most beekeeping groups the information tends to be practical, straightforward and immediate. Moreover, a newsletter for a group of nonprofessionals, who meet on a more or less routine basis and is produced by other nonprofessionals tends to send the same kinds of information in each issue. A standard format is easy to produce, becomes expected by those who read it, and a comfortable 'routine' becomes established.

No matter who the newsletter is for there are some basics that need to appear in EVERY issue, and it was these basics that we used to judge the entries in our contest. These include as a minimum, but are not limited to (in order of importance)...

- * Is the name of the newsletter prominently displayed
- * Is the Editor listed, so he/she can be contacted directly
- * Meeting information
 - Date, time, place and topic
- * Articles, columns or at least entries by...
 - the President
 - the Secretary
 - the Treasurer
- * Educational articles
- * News articles
- * Format (easy to read)
- * Reproduction quality
- * Overall esthetics

Not every newsletter will have all of these, or have all of them all of the time. Or most won't anyway. But they are all important.

The name of the newsletter, and the group publishing it should be prominently displayed on the outside of the envelope, or as a return address if a self mailer. It should be immediately recognized in a handful of bills, junk mail, grocery store flyers, and magazines. That's your competition for attention in the five or so minutes most people spend looking at their mail. The stuff you need or want gets attention, the rest later, or never. Yes, they are looking for the newsletter, but how many other pieces of mail look just like yours, or at least similar. Be proud of your name, and your group.

The contact people in the organization are the communication links with the whole group, and the outside world. Every one of them should be easy to find, by anybody who reads your newsletter. There's a key. New people, or people who read a newsletter at somebody's home, or one that gets picked up at a meeting, or one that gets picked up at the fair...New member wannabes can't find you if you don't put this in.

Meeting information is critical. You don't know how many of our contestants listed their meetings similar to the following...

The January meeting will be at the Wilmar Nature Center on Wednesday. John Dow will speak on migratory birds.

That was it. Not when, exactly where, not time, not any useful information for a nonmember (who will stay that way, by the way). Always be specific. Every time.

Information from the officers on their specific duties, and even committee reports should only be limited by the room available. The President is the leader, and leads by example and planning. Where is the group going? What is it doing? What is the vision? All food from the President to the group. Especially for those who do not make meetings on a regular basis. This is the connection. The same goes for the Secretary, who gives a brief overview of

last meeting, and the Treasurer, who relates the financial status. Need to know stuff here. Sometimes, the thought is that "If they want to know, come to the meeting." Well, some of us can't, but still want to financially support and take advantage of the activities and, yes, the newsletter for our dues. Don't forget us, OK?

Both educational, informational and news articles are space dependent, but should be there if possible. What's going on this month? Beeyard duties? What's blooming? Committee meeting dates? Future meeting dates? Future speakers? Fair dates? The list goes on. Taken from internal and external sources, and members if possible, any newsletter that can make a member a better beekeeper is valuable (see above paragraph).

Finally, and probably least important, though not without value, is the newsletter's appearance. Several things influence this. Budget is a big factor. Opt for a better message in a poorer package if it's one or the other. Information is gold, the rest is just paper. But, like other things in life, neatness counts. So does really bad photocopying. If you can't read it...Type too small, or too large counts, too. As do uncontinued columns, no table of contents, and one column all the way across the page count - against your information being read, that is.

Lots of little things make a great newsletter. And continuity is the icing on the cake. Practical, but interesting. Easily identified. Easy to read. Lots of information. Something you would be proud in showing to a new beekeeper that may want to join our group.

OK, that's enough of the critical. Next time, maybe the time after next, we'll go into more detail on how to make the good stuff happen, and the bad stuff not. ☐

Kim Flottum reads over 100 newsletters a month (really), has edited a newsletter, and helps with a couple more. He's fussy.

CLUB

by Howland Blackiston

O Dues, Auctions, Raffles and R Other Money Makers N E R

A series of articles designed to provide ideas, guidance and a road map for regional beekeeping clubs. Prepared by members of The Back Yard Beekeepers Association (BYBA). Founded in 1993, the BYBA's membership consists of 150 hobbyist beekeepers from Fairfield and Litchfield Counties (Connecticut) and Westchester County (New York).
www.fairfieldweb.com/byba



Most small clubs just can't quite get by on dues alone. Some additional sources of revenue are needed to fill the coffers. In fact, 40 percent of our annual operating budget is generated from sources other than our dues. This article shares some of the approaches the BYBA has successfully used to create a variety of revenue streams.

Membership Dues. Here is the most basic source of revenue for a club. Member dues should be designed to cover most of the costs associated with running the club (newsletter, mailings, speakers, travel, etc.). But it would be a stretch to assume that dues would cover it all. You would need either a whole lot of members, or fees priced higher than the market would bear.

We decided that our basic dues should be affordable to many, so we set them at \$25/year. Dues cover an entire family. Assuming nine general meetings per year, that came to less than \$3 a meeting. A good value, we concluded. BYBA also offers a student rate of \$15/year. And more recently, with out-of-state folks asking to join the club, we decided to establish a discounted "Associate Member" price of \$20/year (associate members are unlikely to attend monthly meetings and eat the refreshments).

Contributing Members. We also encourage "Con-

tributing Member" status. These are the members who pay their regular \$25 dues, and voluntarily contribute some additional amount. A few of our contributing members donate \$100. Most contributing members donate about \$25. Given IRS' charitable status for BYBA, all donations to our club are deductible under the terms of the law. All in all, such contributions account for about 15 percent of our total dues revenue.

Additional funds means better speakers. We've been lucky enough to see our membership grow steadily in the past six years. That of course means we have more dollars to work with. Our ongoing goal is to engage world-class speakers at our monthly meetings. And that means we need a healthy treasury to cover speakers' fees and travel expenses. Dues alone will not allow us to bring in the speakers we want, and support the activities we plan for the year. We needed to find additional ways to cover our expenses.

Auctions. This is a easy, fun and effective way to generate additional funds for the treasury. At the conclusion of each of our general meetings we hold a brief auction. This takes only 10 minutes and can be quite entertaining. Members donate all the goods in the auction, so there is no cost to the club. We suggest the following guidelines to those members who would like

to donate auction items:

What you donate need not be bee-related, but it should be in good working order and something you feel would be of interest to others.

In other words, if *you* have no interest in the tacky hand-painted coasters Aunt Sally gave you 10 years ago, then it is doubtful that anyone else will have interest. Don't waste the time of the audience and the auctioneer. We have found that ordinary bric-a-brac does not do well (napkin holders, clocks, placemats and statuettes). Nor do second-hand videos and non bee-related books.

Items shouldn't be too pricey. Folks don't come to a bee meeting to bid on a two-week trip to Bermuda. The most desirable items are those priced for spontaneous purchase (\$5-\$25).

Get yourself a good auctioneer. We are lucky enough to have a member who has stepped forward at each meeting. He's entertaining, upbeat, and manages to keep the bidding moving along. As to what kinds of items do well, here are the things that have worked for us.

- Home-baked cookies and brownies (The bidding gets fast and furious for quality food items, often generating well over \$25 for something that might cost only a few dollars in the supermarket.)
- Exotic honey (Members who travel donate jars of honey from other states and foreign countries. This always seems to draw interest from the audience, and can result in some sky-high bids.)
- Attractive bee-related crafts (Beekeepers tend to collect such items, so you can't go too far wrong with an apron, potholder, coffee mug or ceramic doodad that's got a honey bee on it. Antique bee items also do well. For example, we had great success auctioning 100-year-old copies of *Gleanings in Bee Culture*.)
- Garden flowers, vegetables and plants (Both cut and potted plants keep the bidding lively. Potted flowers labeled as bee-friendly will stimulate a frenzy of bidding.)

Don't forget to continually remind members that the auctions are important to the club. Encourage members to donate auction items and participate in the bidding. Remind them of this in your monthly newsletter and at the start of each auction.

Raffles. In addition to the auction, we offer a door prize at each monthly meeting. A volunteer sits at the entrance of the room and sells tickets for a chance to win. Tickets are priced at \$1 each (or six tickets for \$5). Members keep one-half of the ticket, and the other half goes into the hat to be drawn at random at the conclusion of the meeting. Members must be present to win. Our raffle items are always bee-related. The board selects an item for the raffle during the directors' meeting prior to the general meeting. The club purchases the item (usually at wholesale price) from a local bee supply house. We try to select items that relate to the beekeeper's calendar. Doing this also gives us an opportunity to remind members of important steps they

should be taking at that time of the year. Here are some ideas for raffle items your club can consider:

- Winter meetings: Good reference books; wax molds; block of pure beeswax; rolled or dipped candles; stainless smoker; hive tools; mead making supplies
- Spring meetings: Hive top feeder; medication supplies; package of live bees; replacement queens; honey supers, frames and foundation.
- Autumn meetings: Uncapping knife; honey jars; honey filter; honey pail with valve; hive top feeder; medication supplies; insulating hive wrap; Insulite board. Note that we have also raffled off the leftover inventory from our Summertime participation in the local farmer's market.


Other ways to generate revenue. There is a multitude of other activities that can help raise money for the club. Here are just a few ideas and comments:

Farmer's Market. This involves a lot of coordination and a good deal of volunteered time, but the financial rewards can be rather substantial. In our case, we generated a profit equal to our getting 50 dues-paying members. For more on what's involved to pull this off, see "Club Corner" article on Farmers' Markets in an upcoming issue.

Speaker's Bureau. We haven't officially launched this effort yet. The plan is to offer club members as speakers-for-hire at other club meetings, garden associations, schools, nursing homes, etc. The speaker's fee of \$100-200 would be shared 50/50 between the club and the speaker. We plan a mailing this year to local nature centers, schools, clubs and associations to alert them to this service from our club. I'll let you know what happens.

The bottom line. Your club's board should explore various ways to generate revenue beyond what your dues bring in. Be creative. Use your imagination. The primary goals of such an effort are to:

- keep annual dues as low and affordable as possible (you will attract more members that way)
- generate enough money to hire the best speakers at your monthly meetings
- have ample resources to support the various community activities your club would like to sponsor (out-reach programs, observation hives donated to nature centers, etc.)

Good luck with your efforts. Let us know what you have tried and had success with. We will try to share your experiences in an upcoming article. You may contact the BYBA at www.fairfieldweb.com/byba/ 

Howland Blackiston is president of the Back Yard Beekeeping Association. He has been a hobby beekeeper for 14 years. When not tending to his six hives in Weston, CT, Howland is president and co-founder of Juran Institute, Inc. - international consultants in how organizations manage the quality of products and services. You are welcome to contact Howland at hblackiston@juran.com

?Do You Know?

Answers

1. **False** Using treated lumber by the process known as "Wolmanizing" for the construction of beehives is not recommended. This process is variable and many different chemicals may be used. In some instances, bees coming into contact with treated wood have died. It is also dangerous to humans; a sawdust mask is now recommended working with treated lumber.
2. **True** Many different kinds of wood can be used in the construction of a hive. Western pine is the best wood to use for hive bodies, lids and frames. Many other woods can be used, but most are less suitable because of their weight, tendency to crack or split, or other characteristics. Hive bottoms made of cedar, cypress, or redwood generally last longer than those made of pine or similar woods.
3. **True** The migratory cover fits flush with the sides of the hive body and may or may not extend over the ends, which allows colonies to be stacked tightly together. This style of lid is used without an inner cover allowing only bee space between the top bars and lid.
4. **True** The number of honey bees foraging from a colony is directly related to the size of the adult population. As the population increases, relatively fewer bees are engaged in the rearing of brood and a greater percentage are available for field work as weather conditions allow. Thus, package bees have proven inferior to strong overwintered colonies for pollination of early season crops.
5. **False** Honey bees should not be moved into a crop until some of the blossoms have opened and the flowers are attractive to them. If the bees are in place too early, they will set up flight patterns to other floral sources in the area and may fail to fully revert to the target crop in succeeding days. Honey bees normally exhibit "floral constancy" during foraging. They continue to gather nectar and pollen from the same floral source until they become dissatisfied with it and are recruited to another source.
6. **False** The primary cause of swarming is congestion in the brood nest. Removal of combs and replacing them with frames of comb foundation will provide additional work for the bees but does not reduce congestion. Instead of reducing the swarming impulse, it is likely to enhance it since the amount of brood rearing and storage space has been temporarily reduced.
7. **True** Colonies should never be allowed to get below 10 to 15 pounds of food at any time, otherwise optimum conditions for brood rearing are not present. If reserves fall below this amount, colonies should be fed or they will likely face starvation.
8. The bees will varnish the inside of the hive with propolis and the inside is not painted to allow the wood to absorb moisture produced by a colony.
9. Storage of food (honey and pollen)
Rearing of brood
- 10A. A southern or easterly exposure gives colonies maximum sunshine throughout the day. With the early morning sun hitting the front of the hive, the bees begin foraging earlier in the day for nectar or pollen.
- 10B. Keeping the hive up off the ground reduces dampness in the hive, extends the life of the bottom board and helps keep the front entrance free of weeds and skunks.
- 10C. Since the bottom board is open in the front, the colony should be tilted forward slightly to prevent rain water or snow from entering the hive, helping to keep a drier hive.
- 10D. Feeding sugar syrup early in the spring acts like an artificial honey flow and serves as a strong stimulus for brood rearing.
11. Congestion within the broodnest is the primary cause of swarming.
12. Adding honey supers on top of a colony does not prevent swarming since it does not relieve congestion in the broodnest, the primary cause of swarming.
13. Empty comb stimulates the hoarding instinct and should result in greater honey production.
14. Hive bodies are typically banded together with metal or plastic bands or are stapled together with 2" x 3/4" hive staples to hold the various sections of the hive together for moving.
15. A. Hard labor involved in closing the hives, loading and unloading them with each move (often means working through the night).
B. Wear and tear on the colonies and equipment during the process of moving (many queens are lost).
C. Increased chances of colonies picking up disease/mites from colonies in the area.
D. Chance of weakening your colonies due to lost field bees or pesticide exposure.
E. Many of the crops that require bee pollination are not good nectar producers.
F. Pollination services may be required at the same time that the major honey flow occurs in the permanent location.
G. Difficult to manage colonies that are moved for pollination; swarming can be a serious problem.

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

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

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



Ann Harman

Home Harmony

Pass The Flowers, Please

About a hundred years ago, W.S. Gilbert wrote "The flowers that bloom in the Spring, tra la, have nothing to do with the case" (from *The Mikado*). Well, with bees, the flowers have everything to do with the case. And this being May, the world is abloom with many flowers.

Although the bees are using the flowers, they won't mind if you take a few and put them to use in your cooking. I have chosen some recipes and information so that you can have fun with those May flowers. Some of the recipes do not use honey. However, I have chosen a few blossoms that the bees find interesting.

The redbud tree, sometimes called the Judas tree, (*Cercis canadensis*) can be found growing wild as an understory tree throughout woodlands in the eastern half of the United States. It is also planted as an ornamental because, once the bright pink flowers fade, the heart-shaped leaves make it an attractive small tree during the Summer months. The redbud is easy to grow since it tolerates both full sun and partial shade, but it does not thrive in a wet, heavy soil.

Redbud is a member of the Legume family, related to clovers, peas and beans and the black locust tree. No wonder bees find it an interesting flower. On a bright, warm day in Spring, take a visit to a redbud tree. After you finish observing all the different kinds of bees eagerly working the open flowers, you may pick some of the buds and open flowers for yourself. The buds, particularly, have a nice crunchy texture suitable for

use in salads and for garnishing hot vegetables, as well as for pickling. The flavor has been described as a cross between a green bean and a tart apple. Nibble a few and make your own judgment on that description. Here are a couple of recipes using redbud flowers and buds.

SAUTÉED REDBUD

This dish can be served alone as a vegetable. An attractive and delicious variation is to toss the sautéed redbud with loose-leaf red lettuce. You will get a lovely combination of textures and colors.

- 1 tablespoon butter
- 1 cup redbud flower buds and flowers

Melt butter in a heavy frying pan over low heat. Add flowers and flower buds. Sauté for 5 to 10 minutes, stirring frequently. Serve immediately.

Edible Flowers
Cathy Barash



PEAS WITH MUSHROOMS & REDBUD

- 1 teaspoon butter
- 1 tablespoon olive oil
- 1 tablespoon Madras curry powder
- 1 teaspoon cinnamon
- 1 pound mushrooms, sliced
- 1 pound peas, frozen or fresh
- 50 redbud flowers

In a heavy frying pan, heat the butter and olive oil over medium-high heat. Add curry and cinnamon, stir well. Lower to medium heat and cook the spices for several minutes, stirring frequently. Add the mushrooms and sauté for 5 minutes or until they are just cooked. If using fresh peas, steam them until they turn bright green, then add them to the mushrooms. If using frozen peas, they can be added directly to the mushrooms without cooking. Continue to cook for 5 minutes. Just before serving, add the redbud flowers

and stir to distribute them evenly among the peas and mushrooms. For a variation, stir in 1/4 cup of sour cream or plain yogurt for a tangy richness. Serves 4 to 6

Edible Flowers
Cathy Barash

Everyone is familiar with the dandelion, a favorite Spring flower of the bees. The dandelion (*Taraxacum officinale*) was brought here by the early settlers because it was a very useful plant for them. The young leaves were used as a green vegetable, the root can be roasted and made into a coffeelike drink; the sweet blossoms with their honeylike flavor were also eaten. Today the dandelion, in spite of its cheerful color, is cursed as a weed in a perfect lawn. Let us join the bees in appreciating the dandelion.

Dandelion blossoms should be picked young since the flavor becomes bitter as the flowers mature. Discard the green sepals since they can also be somewhat bitter. Dandelion blossoms open in the morning and close in the evening. They seem to be at their sweetest before noon. It is best to pick dandelion blossoms immediately before using them, as the flowers close rather quickly after picking.

There are certain to be enough dandelions around for you to enjoy this simple recipe.

DANDELION "MUSHROOMS"

Close your eyes and pop one of these crisp goodies into your mouth. Would you believe it was a dandelion and not a fried mushroom?

- 15 dandelion flowers, rinsed in water, but still slightly moist
- 1/2 cup all-purpose flour
- 2 tablespoons butter

Dredge the moist flowers in flour. Heat the butter in a heavy frying pan. Add

Continued on Next Page

flowers and fry quickly, turning to brown all sides. Serve hot.

Edible Flowers
Cathy Barash

The bright yellow blossoms of wild mustard (*Brassica rapa*) growing in fields and along roads are a common sight in the Spring. This wild mustard has many common names, some of them regional. A relative, broccoli (*Brassica oleracea*), if not harvested as a vegetable, also has the small yellow flowers. So if you miss the Spring mustard, you can still gather some broccoli flowers later in the Summer. Flowers of both the wild mustard and broccoli have a spicy bite, with the broccoli flowers a bit more mild than the wild variety.

TANGY LETTUCE AND CARROT SALAD

This salad is one of the recipes that does contain honey. It is a nice contrast of flavors with the sweet carrots, buttery lettuce and tangy flowers.

1 loose-leaf head of lettuce (Bibb or Boston), torn into bite-size pieces
10 baby carrots, thinly sliced
4 tablespoons olive oil
2 tablespoons vinegar
1 teaspoon honey
1 clove garlic, crushed
salt and freshly ground pepper to taste
20-30 broccoli or mustard florets, petals only

Toss lettuce and carrots in a bowl. Whisk together oil, vinegar, honey and garlic. Season with salt and pepper to taste. Pour the dressing on the salad and mix together with the flower petals. Serves 4.

Edible Flowers
Cathy Barash

Anise hyssop (*Agastache foeniculum*) is a plant very popular with both bees and beekeepers. The honey produced has a wonderful flavor and color. Many beekeepers are now growing anise hyssop as a treat for their bees. Although this is not an early Spring-blooming plant, you can save the recipe and use it when your hyssop comes into bloom. If you are not already growing this plant, a number of articles have been written about anise hyssop as a bee plant. Perhaps you can start some seed this Spring. Anise hyssop will flower the first year.

All you need to enjoy the anise hyssop flavor is a basic honey cookie recipe. Use a mild-flavored honey so that the flavor of the flowers predominates.

HONEY COOKIES

1 cup honey
1 cup butter
2 eggs
1/2 teaspoon vanilla
2-1/2 cups flour
3 teaspoons baking powder
1 teaspoon salt
1/4 cup anise hyssop florets removed from their stems

Cream honey and butter until light. Add eggs and beat until light and creamy in color. Add vanilla and dry ingredients. Beat until well-blended. Add blossoms and mix well. Drop from teaspoon, leaving room for batter to spread. Bake at 375° for 12-15 minutes.

Adapted from The Honey Kitchen
ed. by Dadant

Mixtures of flowers are also pleasant. You can experiment to find combinations you like. In general, mix sweet flowers together or spicy flowers together. You can dry petals for future use, just as you dry herbs. Store in an airtight glass jar and use half the amount of dried flowers as fresh.

You can make some flower-flavored honey very easily. The amount of water from the petals should not be enough to raise the water content of the honey significantly. The blossoms will color the honey.

FLOWER HONEY

1/2 to 1 cup chopped, fresh flower petals or crushed, dried petals
1 pound honey

Add flowers to a jar of honey. Cover the jar loosely and place in a pan half-full of very hot water. Let sit in the hot water for 10 minutes. Remove the jar from the water and allow to cool to room temperature. Tighten the cover. Let it sit for at least a week. If desired, strain before eating.

Edible Flowers
Cathy Barash

For a flower jelly, you will need to make an infusion of the flowers of your choice.

Use 1 cup solidly packed flowers to 1-1/4 cups water. Steep the flowers in the water in a covered glass or ceramic container for 1 or 2 days or until the liquid smells and tastes of the flowers. An alternative

is to boil the water and pour it over the flowers in a glass or ceramic container. Let steep, covered, for 10 to 15 minutes. The cold water method results in a clearer jelly. Strain and use the liquid in the following recipe.

FLOWER HONEY JELLY

Sometimes jelly made with honey does not make a firm jell. You can always use it as a syrup, just as you would honey. (Use on ice cream, pancakes or waffles.) You can use this recipe or one that comes with the particular pectin you use.

1 cup prepared liquid
3 cups (2-1/4 pounds) honey
1/2 bottle fruit pectin

Place liquid in saucepan. Add honey and mix well. Place over high heat and bring to a boil, stirring constantly. At once, stir in fruit pectin. Then bring to a full rolling boil and boil hard 1 minute, stirring constantly. Remove from heat, skim off foam, and pour quickly into glasses. Cover at once with paraffin. Makes about 3-1/4 cups

General Foods Corporation

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Questions?

What To Burn?

I installed four nucs in May. One of the hives had a few cells of AFB, and the other three have, of course, been exposed. I was advised to burn all the combs of brood in the diseased hive but just burn the original nuc frames in the other three, give them all three doses of TM at five-day intervals, then put on an extender patty. Won't the AFB come right back as soon as the extender patty is eaten? Also, is there a solution I can use to wash my hands after handling those combs?

Gregory R. Mason
Troupsburg, NY

The advice you were given seems good to me, although I'm not sure it is necessary to burn combs that show no sign of disease. No, the AFB should not come back when the extender patty is gone. Once the disease is cleared up, it should stay that way, provided you do the routine TM treatment each Spring. As for hand washing, soap and hot water are fine. Bear in mind a strong colony of bees does a pretty good job of cleaning out AFB, up to a point.

Recombine

After shook swarming, could you not, instead of recombining with the parent colony, overwinter the shallow super, providing adequate drawn comb and stores?

Charles F. Byram
Oak Ridge, TN

You could do that, if you wanted to increase from one colony to two, but the overwintered colony would have an old queen. It would be simpler to recombine the shook swarm colony with the parent colony and then, if you want to increase, do it in Spring.

What Went Wrong?

One of my two colonies swarmed, gathering on a branch that I could not cut, so I scraped the bees into a box as best I could and dumped

them in front of a hive containing frames of foundation and one comb of brood. They stayed, but a few days later the same colony swarmed again. I was able to remove this branch, and shook the bees in front of a hive which again contained foundation and one comb of brood, but about half the bees clung to the branch, so I laid this in front of the hive. An hour later I returned to find the hive empty. What did I do wrong? Should I have shaken the bees directly into the hive? How often does this happen?

Michael Hubbard
Wilmington, NC

The reason the second swarm did not stay put is that the queen remained outside, and the bees flew off with her. A swarm will almost always stay put if they find brood in the hive, even without their queen, but this second swarm had not discovered the brood in sufficient numbers, so their impulse was to remain with their queen. The best way to have a swarm, after putting a frame of brood in the hive, is to set an empty hive body on the new hive (with cover off, of course), dislodge most of the swarm into this, and cover it up. The bees thus find the comb of brood immediately, and they stay. But don't go off and leave that empty hive body there, or the bees will cluster in it and begin to build comb there.

A New Home

I inherited some colonies of bees in homemade equipment, and the frames are in bad condition. How can I transfer the bees onto new frames? I hate to destroy old frames containing brood.

Chris Hardwick
Pueblo, CO

It is virtually impossible to get bees to abandon combs containing brood. I assume you want to get these bees into new equipment containing foundation only. You could, of course, just shake and brush all the bees off the combs, but that would mean losing all the brood, which you quite rightly do not want to do. The brood is very valuable. About all you can do, I think, is put the full-depth supers of foundation over those old colonies, let the bees store honey in them, and then, come Spring, get the queens up into the new hives separated from the old hives below by excluders. You can do this by shaking all the bees (queen included) into the new supers, to which the queens will be confined (by the excluders) while other bees go below to tend the brood. In time the old brood will all be hatched out and the brood nest will be up above, where you want it. If the old hives are of unorthodox size, you can use strips of wood to partially cover the tops of them. All this will take a good part of the season, of course.

Dissect & Attract

Can a hobbyist synthesize the Nasanov pheromone by dissecting replacement queens, and use it to attract swarms?

Bert Clayton
North Charleston, SC

This strikes me as totally impractical. The synthetic pheromone can be purchased from the Brushy Mountain Bee Farm.

Why Treat AFB?

If all that is necessary to keep AFB dormant is a powerful colony headed by a vigorous queen, then why is it necessary to treat colonies with Terramycin?

J.B. Barrett
Gaston, IN

Continued on Next Page

Answers!

Richard Taylor

It is true that a strong, well-managed colony has a high degree of resistance to AFB, but there are still very good reasons for using Terra, especially in the Spring. (1) Terra, mixed with powdered sugar and applied two or three times at approximate one-week intervals, is highly effective, inexpensive and very easy to use, so it is a simple and wise precautionary step; (2) colonies are often not very strong in the Spring; and (3) a strong and vigorous colony can become weakened, by swarming, for example, or by stress.

Rejected

I have a lot of trouble requeening my hives. Too often the queen I buy gets rejected, and I end up letting the bees raise their own new queen. Right now I have a queen that is slowing down, and I want to replace her. What is a sure-fire method?

**Russell Willsey
Sebring, FL**

The fact that a queen is slowing down in egg laying is not necessarily a sign that she needs to be replaced. Sometimes it just means that there is a dearth of nectar. The only sure-fire way of requeening that I know is by introducing a queen that has first been accepted by a nuc (nucleus colony). Thus: Remove three or more combs of bees and brood, but not the queen, from the hive you want to requeen (or any other hive), replacing these temporarily with empty combs or frames of foundation. Put these combs of bees and brood in a nuc box, or in a regular hive if you don't have a nuc box, and introduce the queen to the nuc. Since the flying bees will all have flown back to their hive, acceptance by the nuc is all but certain. When acceptance by the nuc has been verified, combine the nuc with the colony you want to requeen, making sure you first destroy the old queen and any queen cells. This always works.

Killing The Old!

I requeen my colonies every year, and this year I am thinking about simply killing the old queen and letting the bees requeen themselves. Would this result in a de-

terioration of the strain?

**W. Wollsey
Sebring, FL**

I don't think there is anything wrong with that idea. I have always thought that the strain or race of the bees is much less important than how the bees are managed. The main difficulty with letting the bees requeen their colony themselves is waiting for the queen to mate and start laying, but that is no great problem if you do it in the Fall, after the harvest. In the past few years there have been problems with purchasing mated queens, getting queens who have poor brood patterns, excessive supercedure, etc. These problems are largely avoided by self-requeening.

Editor's Note: *The down side of this is Varroa treatments have been shown to be detrimental to new queens. Timing to avoid strips is important.*

Evodia Seedlings

Where can I get Evodia seeds or seedlings?

It is too late for seeds, which require winterizing, but we expect to have seedlings this Spring. See classified ads for details.

Questions are eagerly solicited. Send them to Dr. Richard Taylor, Box 352, Interlaken, New York 14847 (not Medina) and enclose a stamped envelope for direct response.

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MAY, 1999 • ALL THE NEWS THAT FITS

AAPA Excellence

SHIMINUKI AWARDED



Dr. Hachiro Shiminuki is the recipient of the 1999 American Association of Professional Apiculturists' Excellence Award. He was selected for his contributions to apicultural research and his leadership in apiculture related issues. Dr. Shiminuki has been active in research for over

30 years. His contributions include basic research on American and European foulbrood, Nosema, parasitic mites and most other pests or pathogens affecting the bee industry. Recently, he has been at the forefront in developing plans and alternative control products to combat miticide resistant *Varroa* mites and American foulbrood resistant bacteria. Throughout his career, Dr. Shiminuki has been able to foresee problems that could arise in the industry and direct research into these areas in advance of the problem. He is called upon repeatedly by industry, state, federal and international agencies for advice and direction on issues of research and policy. His distinguished career has provided him a wealth of experiences, and in many ways, he is the institutional memory for bee research in the U.S. Dr. Shiminuki has served on numerous technical working groups, international panels, and he is currently President of the International Bee Research Assn.

10 Top Reasons To . . . PARTICIPATE IN APIMONDIA

10. Apimondia congresses are rarely held in North America, so take advantage of this opportunity to visit western Canada and attend the best beekeeping congress ever held!

9. The relatively low value of the Canadian dollar (1\$CAN = US\$.65) makes Canada an attractive destination for foreign participants.

8. Participants can compete for medals in contests relating to beekeeping equipment, photography, films and videos, commercial exhibits, books, and other categories.

7. Vancouver, the site of

Apimondia '99, has a wide range of accommodations to meet your tastes and budget, including nearby recreational vehicle sites, hotels, bed and breakfasts, suburban motels, and first-class hotels.

6. The Vancouver Trade and Convention Centre, the venue for Apimondia'99, is one of the most attractive and functional convention centres in the world.

5. More than 200 authorities, selected on the basis of their expertise and their ability to communicate to beekeepers, have accepted the invitation to speak in the more

Continued on Page 57

Working At Cornell

NEW APICULTURE EXTENSION SPECIALIST

Dennis van Engelsdorp recently began work with the Cornell University Apiary Research Program. Dennis received his undergraduate degree at the University of Guelph in Ontario, majoring in Horticulture and minoring in International Agriculture. Dennis received an MS in Environmental Science under the supervision of Dr. Gard Otis. His thesis research was entitled "A field evaluation of nine genetic lines of honey bees for tracheal mite resistance and other economically important traits." After completing his MS, Dennis worked in the Caribbean as a consultant with the Antigua Beekeepers Cooperative for three years.

Dennis will work as an extension specialist in Apiculture with the Cornell University Program under the direction of Professor Nicholas Calderone. Dennis' primary focus will be the development of a series of workshops designed to

service beekeepers, fruit and vegetable growers, and various state agencies with functions affecting beekeepers. The centerpiece of the Extension Program is the Master Beekeeper program. This four to five year program is designed to: Increase the knowledge base of New York beekeepers, increase public awareness of the importance of bees and beekeepers, increase the profitability of beekeeping by encouraging diversification and business management skills, and increase links with other interest groups. The Apprentice Level Spring Course is scheduled to be offered at five locations throughout New York State this Spring. People interested in attending this course, or receiving more information regarding this course, should write Dennis at: Cornell Apiary Research Program, Cornell University, Comstock Hall, Ithaca, NY, 14853, or at dv23@cornell.edu.

In Australia

INSPECTION GOES TO THE DOGS

Australia's quarantine service has trained sniffer dogs to detect illegal imports of queen bees.

The dogs are stationed at international airports and mail sorting centers.

Australian Quarantine and Inspection Service spokesman David Banks said the dogs were trained because of the fear that *Varroa* could be introduced to Australia by illegal bees.

Australia is one of the few countries left without *Varroa* and the beekeeping industry earns from A\$6

million to A\$8 million a year through exporting queens.

Beekeepers in Queensland and the New South Agriculture Department supplied the queens for the training program. The dogs have a detection success rate of around 97 percent.

Banks said thus far the dogs have not detected any illegal bee imports, but knowledge that the beagles can intercept the insects may be acting as a deterrent.

USDA NEWS

Biotechnology Reviewed Agriculture Secretary Dan Glickman announced (March 19) that he is creating a new USDA panel to review agricultural biotechnology issues. The Advisory Committee on Agricultural Biotechnology will also advise the Secretary on policy related to the creation, application, trade and use of agricultural biotechnology. Glickman said, "This advisory committee will examine the effect of biotechnology from every conceivable angle - its creation, application, marketability, related trade and inspection implications and more." The panel will be appointed by the Secretary at a later date.

Marketing Order Personnel The U.S. Department of Agriculture's Agricultural Marketing Service (AMS) is expanding its efforts to encourage participation of eligible persons on fruit and vegetable marketing order committees. By calling 1-800-384-8720, growers, handlers and others may obtain detailed membership information. Marketing agreements and orders are self-help tools that members of agricultural industries can use to solve marketing problems that they cannot solve individually. Dr. Enrique E. Figueroa, administrator of USDA's AMS, said that, "In order to be effective, marketing order committees need individuals who represent a cross-section of their industries. It is USDA's policy that its boards and committees accurately reflect the growers who produce the products."

Farmland Reserved The U.S. Department of Agriculture will accept nearly 5.0 million acres of environmentally sensitive farmland into the Conservation Reserve Program (CRP). USDA is notifying farmers and ranchers of the decisions regarding their CRP offers that started March 4. Glickman said, "I am very pleased with results of this sign-up. Our nation's farmers and ranchers continue to demonstrate their commitment to the environment and to America's long-term productivity." This enrollment will result in annual outlays of more than \$200 million beginning in October 2000.

Crop Germplasm Snared A budding cooperative project of researchers, organic growers and others could help replenish the nation's seed banks. More important, it could create market opportunities for new public and heirloom crop varieties.

The Agricultural Research Service, maintains the National Plant Germplasm System. Its 27 repositories now hold about 437,000 specimens of germplasm—seed, cuttings and other tissue. Thousands of accessions are added each year. Researchers worldwide use the germplasm to breed crops with improved yield, nutrition, resistance to pests, disease and environmental stress or other traits.

ARS is cooperating with the Farmer Cooperative Genome Project to test a new way for organic growers, farmer cooperatives and small seed companies to tap into this storehouse of genetic diversity. FCGP members will grow fresh supplies of germplasm, following NPGS guidelines. These ensure, for example, that regenerated seed is true to type—not contaminated by pollen from nearby crops of the same species.

FCGP members will also develop marketable new varieties from germplasm they may never have known about otherwise. For example, an ARS repository in Corvallis, OR, has more than 400 heirloom pear varieties. In Pullman, WA, ARS maintains more than 200 lines of garlic. These represent most of the crop's genetic diversity. Only a few varieties account for nearly all commercial production, according to horticulturist Richard Hannan. He's based at ARS' Western Regional Plant Introduction Station in Pullman.

More than 200 small family farmers, organic farmers, seed producers, breeders and others will participate in FCGP, according to J.J. Haapala. He is research and education director of Oregon Tilth, a growers' group in Salem that certifies organic growers and processors. Haapala administers a USDA Fund for Rural America grant to the FCGP.

Fast Food Failure Increasingly, America's family dining table is not at home, but at a fast food outlet or restaurant. Yet, according to a new report from the U.S. Department of Agriculture, the nutritional content of meals eaten away from home is failing to keep pace with nutritional improvements in home-prepared foods. Compared with home-prepared foods, food made outside of the home contains more of the nutrients that Americans overconsume, such as fat and saturated fat, and less of those that they underconsume, such as calcium, fiber and iron. According to Agriculture Secretary Dan Glickman, "Americans should be aware of this nutritional gap. It reinforces the need for nutrition information and education in schools and at home, so that everyone can make more healthful food choices." The report, "Away-from-Home Foods Increasingly Important to Quality of American Diet" is available at <http://www.econ.ag.gov> or by calling 1-800-999-6779. Contact: John Snyder (202) 694-5138.

AG Library News NAL is part of the Agricultural Research Service, USDA's chief scientific arm, and the library's links to scientific research are as plain as the views from its windows. The towering, 14-story library building looks west toward the labs and research fields of the largest of ARS' 100-plus research locations—the 7,000-acre Beltsville Agricultural Research Center. The Beltsville Bee Lab sits nearby.

When President Lincoln established USDA in 1862, he noted that its mission would include "to acquire and diffuse among the people of the United States useful information on subjects connected with agriculture."

Accordingly, the first U.S. Commissioner of Agriculture, Isaac Newton, established an agricultural library in which "the most valuable works would gradually accumulate by exchange, gift, and purchase, forming a rich mine of knowledge."

Since that time, NAL's knowledge media have shifted from paper and ink to computers and cyberspace. Its clientele, once mainly U.S. scientists and farmers, now is global.

This "mine of knowledge" is no musty accumulation gathering dust on the bookshelves. NAL handles 220,000 requests a year from scientists, teachers, government officials, farmers, business leaders, students and others around the nation and the world.

The NAL treasure trove extends over 50 miles of bookshelves, with 3.3 million books, reports, databases, artifacts, audiovisuals, periodicals and other items. Growing by upwards of 130,000 accessions each year, the library has materials in about 75 languages.

The computer age has brought NAL new ways of doing business, including sending out most materials electronically. An extensive web site, offering access to library staff, products and services, currently receives 11 million "hits" a year. The web address is: <http://www.nal.usda.gov>

Elementary to high school students who need science project ideas in a hurry now have on-line access to a list of 140 publications chock full of project ideas, most related to the agricultural sciences.

The bibliography Projects and Experiments for Young Scientists was created by the NAL Technology Transfer Information Center (TTIC). The project is part of an effort by the Agricultural Research Service (ARS), NAL's parent agency within the U.S.D.A., to interest young people in science and research. NAL staff will use the bibliography to respond to students who contact the library for ideas on science projects and research.

The bibliography is available on the NAL home page at: <http://www.nal.usda.gov/tric/misc/juvag.htm>

Copies are also available by contacting the Technology Transfer Information Center, National Agricultural Library, 10301 Baltimore Avenue, 4th floor, Beltsville, MD 20705-235, telephone (301) 504-5372, ttic@nal.usda.gov.

ARS has also created a Web site, called Science for Kids, that highlights the agency's research in simple language geared for students ages 8 to 13. Science for Kids can be found at: <http://www.ars.usda.gov/is/kids>

NAL is the largest agricultural library in the world and has been serving the agricultural community since 1862. It is one of four national libraries of the U.S.

Genetically Modified Crops Visited The National Academy of Science has announced the appointment of an expert committee to investigate the kinds of risks and benefits of genetically modified (GM) crops containing pesticide genes and the coordinated domestic federal regulatory framework affecting the development and use of these crops. The study will 1) review the principles in the NAS Council's white paper, "Introduction of rDNA-Engineered Organisms into the Environment" (1987), for their scientific validity and assess their appropriateness for current decisions regarding GM crops containing pesticide genes, 2) review data which addresses the hypothesized risks and benefits of these crops, 3) examine the domestic regulatory framework in light of the identified scientific risks and benefits, 4) examine the domestic regulatory framework to qualitatively assess the social and economic impacts of existing statutes, and 4) provide recommendations on research needed to address the scientific risks/benefits and, if warranted, on the regulatory framework for genetically modified pest resistant plants.

The formation of the committee, chaired by Mike Phillips, was announced March 19 and is composed of a panel of 13 scientists and other experts. The committee began work in Wash., DC April 8. The project is expected to conclude after eight months. A list of committee members and an overview of the project scope are posted on the NAS website (<http://www4.nas.edu/cp.nsf>; choose "By Subject," then "Agriculture," then "Committee on Genetically Modified Crops. . .")

A Microcosm Of U.S. Ag

EXOTIC PESTS IN CA

The University of California Agricultural Issues Center will report results of a study on exotic pests and diseases at a conference May 25, in Sacramento.

Invaders, such as red imported fire ant, chrysanthemum white rust, Mediterranean fruit fly, yellow starthistle and foot and mouth disease, can cost millions of dollars, shut down trade, upset the balance of biological pest control programs and pit urban, agricultural and environmental interests against one another.

"California is particularly vulnerable to non-indigenous pests and diseases," said Daniel Sumner, a UC Davis agricultural economist and director of the Agricultural Issues Center. "Our study will analyze the diverse threats and public policies, and will clarify the public's interest in pest and disease exclusion and control."

The topics are: Weeds - Yellow Starthistle; Ash Whitefly - Chrysanthemum White Rust; Mediterranean Fruit Fly; Citrus Canker - Avocado Thrips and Mites; Soil Nematodes - Rice Blast; Foot and Mouth Disease - Exotic Newcastle Disease; International Sanitary and Phytosanitary laws - National and International Nursery Regulations;

Red Imported Fire Ant; Bovine Spongiform Encephalopathy.

There will be opportunity for audience participation throughout the conference.

The one-day program is intended for policy leaders and decision makers, state and local officials, legislators and their staffs, farmers and agricultural industry officials, government regulators, representatives of consumer and environmental interests and other members of the public.

Running from 8:15 a.m. to 5 p.m. Tuesday, May 25, the conference will be at the Sacramento Convention Center, 1400 J Street, Sacramento.

To register, send a check for \$95 per person payable to "UC Regents" to UC Agricultural Issues Center, One Shields Ave., Davis, CA 95616. (After May 18, registration is \$125.) To register using a credit card call 530.752.2320. Hotel rooms are being held until May 3 at the Holiday Inn Capitol Plaza, 300 J Street, Sacramento, at a special rate of \$93 (plus 12%). For hotel reservations call 800.465.4329.

For more information about the conference contact the Agricultural Issues Center at 530.752.2320 or agissues@ucdavis.edu.

APIMONDIA ... Cont. From Pg. 55

than 30 plenary sessions and symposia.

4. Vancouver, British Columbia, was voted the best international destination in 1998! As a tourist destination, the city is unsurpassed, and it serves as the starting point for trips to the nearby coast and mountains.

3. The seven Plenary Sessions will feature world authorities talking on all aspects of honey bees and beekeeping. Their presentations will be simultaneously translated into French, Spanish, and German.

2. ApiExpo'99, the International Exhibition and Trade Show, will allow beekeepers to view beekeeping supplies and products from throughout the world.

1. Apimondia'99 will provide beekeepers and scientists the opportunity to exchange ideas with colleagues from throughout the world.

Throughout the week, from dawn to dusk, there will be ceremonies, plenary and symposium presentations, ApiExpo'99, scientific posters, and the mid-week excursion to keep you entertained.

Apimondia'99, the biennial congress of the International Federation of Beekeepers' Associations, will take place in Vancouver, Canada 12-18 September 1999. Plan now to participate.

For additional information, see the website: <http://www.apimondia99.ca>

To receive the 2nd circular containing details about the congress, send your name, contact information to: Apimondia'99, c/o Venue West Conference Services, Suite #645 - 375 Water St., Vancouver, British Columbia, Canada V6B 5C6, Fax: 604.681.2503; email: congress@venuewest.com

NHB & BARNEY TEAM UP

Two years ago, the National Honey Board contacted a number of children's television programs suggesting that honey, beekeeping and the workings of a beehive would be excellent material for their shows. Both Sesame Street and Barney & Friends agreed! The segment Sesame Street created has been airing since December of 1997. The segment Barney & Friends filmed, "Sweet as Honey," will air national the week of April 5, 1999.

As the project got underway, the National Honey Board provided beesuits, video footage of bees gathering nectar and background infor-

mation to help the producers write the script. The finished 30-minute segment touches upon the job of a beekeeper, the jobs bees perform in the hive and their importance to pollination as well as the delicious taste of honey. Barney's friends even teach the audience how to make Teddy Bear Toast (toast with butter and honey shaped with a cookie cutter to look like a bear). Barney & Friends is seen by 11 million viewers weekly. To get the date and time when "Sweet as Honey" will air on Barney in your area, please call your local PBS affiliate.

ORGANIC LABEL ALLOWED

In what some say is the first time USDA surrendered its product standard setting power on labels to a third party. Agriculture Secretary Glickman announced he'll allow meat and poultry products to carry "organic" label claims, even though there is no federal definition of organic as it applies to meat and poultry.

While currently federally prohibited from making any claim that an organic product is any better, healthier or from a more humanely raised animal than a conventional product, organic producers have long claimed they need to make some sort of health or humaneness claim to distinguish their products from conventionally produced meat, milk and eggs.

The Organic Trade Assn. (OTA) says "Organic meat, poultry and egg products come from farms that have been inspected to verify that the farms meet rigorous standards which mandate the use of organic feed, prohibit the use of antibiotics, and give animals access to outdoors, fresh air and sunlight."

To use the label claim, a producer will have to be certified by one of the more than 44 private and public groups claiming to know what organic is. None of these standards is identical to another, and there is a fear that some organic producers will seize the simplest set of standards by which they could call a product organic.

Animal Industry Foundation Newsletter

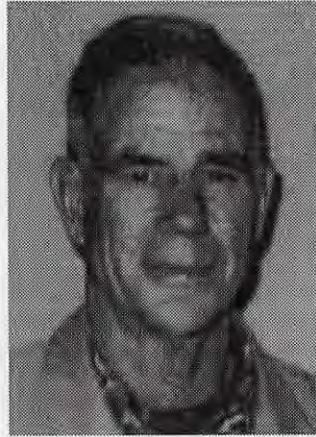
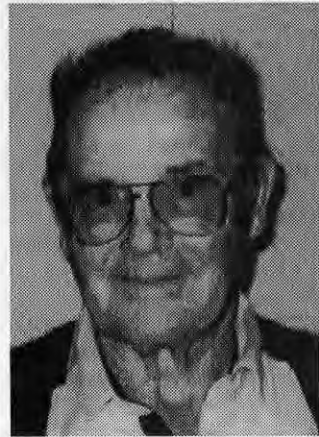
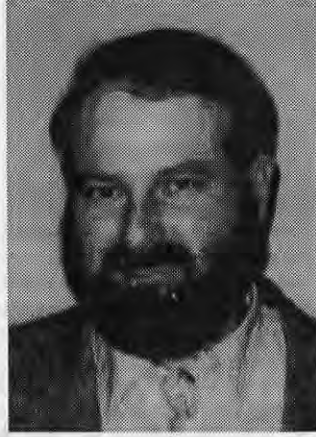
LA & IA QUARANTINED

February 18 the Iowa Department of Agriculture and Land Stewardship filed an emergency rule which prohibits the shipment of bees to Iowa from the states of Florida, Georgia, North Carolina and South Carolina (which took effect immediately upon filing). Queens in individual queen cages with a health certificate are exempted from this prohibition. However, queen banks and queen battery boxes are not allowed. A "sunset" provision was included in the rule so that a year from now the rule will no longer be in affect unless a new rule is made.

The Louisiana Department of Agriculture and Forestry (LDAF) has implemented a quarantine prohibiting the movement of honey bees and used beekeeping equipment from any areas where the small hive beetle (SHB) is discovered. The Louisiana Beekeepers Association (LBA) requested quarantine action against the SHB at their annual meeting in December 1998, as it has been determined to be a serious honey bee pest. Since the SHB is a recent discovery in the U.S. and is not known to occur in Louisiana, the LDAF imposed the SHB quarantine, effective at noon February 1, 1999.

CA HONORS ITS OWN

At the California State Beekeepers Annual Meeting in November in San Luis Obispo, the following people were honored and presented with individual awards.



Top Left - Buddy Ashurst, Beekeeper of the Year; Top Right - Frank Pendell, Young Beekeeper of the Year. Center Left - Phil Clinton, Lifetime Honorary Beekeeper; Center Right - Joe Traynor, Distinguished Service. Bottom Row - Liz Vaenoski, Lifetime Honorary Beekeeper.

BEEF & ALMOND BOARDS OKed

The U.S. Supreme Court refused January 19 to hear a constitutional challenge to the 1985 Beef Promotion and Research Act.

The request to hear the case, filed by Kansas cattle producer Jerry Goetz, was rejected without comment or dissent.

The Beef Promotion and Research Act was part of the 1985 Farm Bill, and requires cattle producers to contribute \$1 per head for promotion and research programs to improve the marketing environment for beef. The checkoff program was approved by 70% of beef producers in a 1988 national referendum.

The national beef checkoff funds are spent in the areas of promotion, research and information to increase demand for beef and veal.

California almond growers united to vote in favor of continuing their federal marketing order, the Almond Board of California, with an impressive 90% approval rating – one of the highest in the history of the Almond Board and any commodity board.

Dr. Enrique Figueroa, administrator of USDA's Agriculture Marketing Service, said this was the first continuance referendum held since the order was amended in 1996. The change requires growers to vote periodically to continue or terminate Marketing Order 981, which regulates the handling of almonds grown in California. USDA reported a total of 1,683 growers participated in the vote.

The Almond Board of California administers a grower-enacted Federal Marketing Order under the supervision of the United States Department of Agriculture. Established in 1950, the Board's charge is to promote the best quality product and increase production of almonds, California's largest tree nut crop. The Board seeks to expand domestic and international markets for almonds through generic public relations, advertising and other marketing activities.

OBITUARIES

Clifford G. "Cliff" Wolterstorff, 83, Knapp, WI, died March 2. He was born in Woodbury, MN and in 1937 graduated from the University of Minnesota School of Agriculture.

For several years Cliff worked as a farm manager before buying his farm in Knapp.

For over 40 years he was very active in the local beekeepers and state organizations. He and his wife, Bernice were honored by the Wisconsin State Honey Producers Association in 1989 as State Beekeepers of the year and in 1997 they received the Pioneer Award.

Cliff is survived by Bernice, his wife of 60 years, two sons, two daughters, and eight grandchildren. Two granddaughters reigned as Wisconsin State Honey Queens.

Robert Dean Banker, age 80, a Cannon Falls area resident for 65 years, died March 26, 1999.

In 1933, at age 15, he started with his first colony of bees, and remained in the beekeeping business for over 50 years. He was involved in the business until 1994, the latter years being in the management area. For nearly 20 years, they had a self-service honey stand on Highway 52 near their home. Throughout the years, Bob had received many awards in the beekeeping industry. He was a member of the Sioux Honey Association for 33 years and a member and officer of the American Beekeeping Federation for about 30 years. He served as president from 1964-65.

He is survived by his wife of 58 years Burnette, children Sharon Prink, Gary Banker and Marcie Flom, six grandchildren and one great-granddaughter.



MN QUEEN



The Minnesota Honey producers Association is proud to announce that Angie Olson has been named the 1999 Minnesota Honey Queen. Angie is an 18-year-old freshman at Northwestern College in St. Paul. She is the daughter of Don and Kaye Olson of Plymouth, Minnesota.

Angie has been active in the Minnesota Queen program since July, 1998. During her reign she has made appearances at schools, parades, beekeepers' organizations, and the Minnesota State Fair, working in the Agriculture/Horticulture building promoting the beekeeping industry.

IN B.O.Y.



The Indiana State Beekeepers Association presented Juanita Graham with the states beekeeper of the year award. Juanita is a second generation beekeeper. She and her husband own and operate Grahams Bee Works in Morgantown, a small southern Indiana town. Juanita spends a lot of time traveling with her portable observation hive to schools, churches, retirement homes and any other place where people want to learn more about honey bees.

WI QUEEN



The Wisconsin Honey Producers Association is proud to announce that JoAnna O'Rourke has been named the 1999 Wisconsin Honey Queen. JoAnna is an 18-year-old freshman at the University of Minnesota-Duluth majoring in biology. She is a 1998 graduate of Rice Lake High School where she was a member of the National Honor Society. She is the daughter of Joe and Marilyn O'Rourke of Sarona, Wisconsin.

BANANA WAR MASHED

The World Trade Organization has given the United States permission to impose penalty tariffs on \$191.4 million worth of European imports annually, getting to choose from a list that includes British sweet biscuits, Louis Vitton handbags, and German coffee makers. The 100 percent tariffs, which are designed to eliminate the targeted products from U.S. stores, were awarded by the World Trade Organization on Tuesday as a fallout from a nasty trade war between the United States and Europe over bananas. The WTO ruled that U.S. banana companies were suffering \$191.4 million in lost

sales annually because of unfair European restrictions that favor bananas grown in former European colonies in the Caribbean and Africa. The final list of targeted products will be selected from an original target list and will be published within the next few days in the Federal Register. My advice: go out and buy your Belgian chocolates and pecorino cheese now. The ruling is also seen as an important precedent for a second trade fight the United States is waging with Europe over its ban on American beef containing growth hormones.

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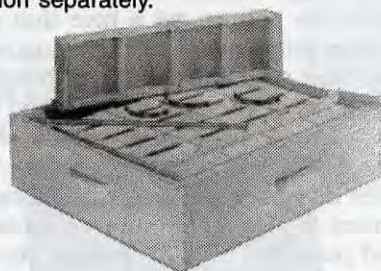


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You are in over your head when . . .

- Honey supers are too heavy to carry, and you need help.
- You did not add enough honey supers, and burr comb has been built everywhere including between the inner cover and top cover. You have a mess.
- You find queen cells ready to hatch, and the main swarm has already left.
- You have no extra honey supers so you throw a box without frames on the hive to give the bees extra room until you can build the frames to put into the box. Unfortunately, something else comes up, and you don't get around to building the frames.
- You wait until April to order a package of bees, and the supply of package bees is exhausted, so you contact everyone you know for help to get a hive that died out restarted and you finally get a swarm in early August.
- You checked your hive and you found that wax moths have made a mess of your equipment, and you don't fish.
- You wait until cold weather to take off your honey and find that the honey has granulated before you can extract.
- Your bee inspector tells you that he cannot pry out frames in your hives to inspect without doing damage.
- You did not get around to pulling your Apistan strips out of the hive and left them in all Winter and just plain forgot about them when you put honey supers on the hive.
- You have more *Varroa* mites than bees.
- You find that your bottomboard has disappeared into the ground below the hive.
- You break out in welts and itch all over your body after a bee sting.
- Your wife puts her foot down and says, "It's the bees or me!"
- Your neighbor turns you in to the zoning department for having bees in your yard and is leading a drive to get an ordinance to abolish bees from within the city limits.
- Or worse, your neighbor hires an attorney and claims your bees have stung her child and caused a considerable medical bill when she took the child to the emergency room for the sting. The attorney claims that DNA from the stinger will identify your bees as the culprits.
- You are always being blamed for yellow jackets in your neighborhood by people who mistake them for bees and blame you for the problems.
- When moving a hive of bees to a friend's house for free pollination, a car pulls out in front of you. You slam on your brakes – the hive in your minivan crashes into the back of your seat and comes apart.
- Your neighbor is complaining about little yellow spots on his car. He is trying to figure out what tree is causing the damage.
- You say "To hell with it!" when the bee inspector says your hive has both mites and PMS.
- You put new frames with wax foundation on your hives after the honey flow is over.
- You end up with more honey than you can give away and don't know what to do with it.

- You just used BEE GO to remove bees from honey supers, and when you enter the house, your family wants to know what pig farm you have been visiting.
- Your hive has more drones than worker bees.
- You buy a nuc with deep frames and want to put them into your medium-size equipment.
- You spend your Winter months designing a perfect hive body.
- You must have the latest device being sold which will increase your honey yield and reduce labor because the ad said so.
- You are planning on an outstanding honey crop by planting some honey plants in your yard.
- You decide to make sure your bees stay warm and comfortable during the Winter months by buying a good blanket of insulation, wrapping the hives, and placing a large plastic garbage bag over everything to protect against moisture.
- When you melt beeswax on the kitchen stove and leave for just a few minutes to do something else while the wax melts.
- You quit your regular full-time job to go into beekeeping.

In Over Your Head?

Dana Stahlman

BOTTOM BOARD