Bee Culture

MAY 1993

INSIDE . . .

M a

COLUMNS

DEPARTMENTS

JOHN ROOT
Publisher

KIM FLOTTUM
Editor

John Root *Publisher*
Robert Stanners *Assoc. Publisher*
Kim Flottum *Editor*

Kathy Summers *Production Coordinator*
Susan Steppenbacker *Photo Supervisor*
Diana Sammataro *Consultant*
Buzz Phillips *Circulation Director*

Dawn Feagan *Circulation & Advertising*

Contributors: *Roger Morse, Richard Taylor, Michael Burgett, Dewey Caron, Jeff Ott, Dick Bonney, B.A. Stringer*

Subscription Rates:
United States, one year, $15.00; two years, $28.00. Newsstand Price: $1.95. All other countries, (U.S. Currency only), $7.50 per year additional for postage. Send remittance by money order, bank draft, express money order or check. Published monthly. Change of Address: Return completed form contained inside issue. Articles are solicited opinions expressed by the authors are not necessarily those of the publishers.

Advertising:
For information on placing display advertisements, contact our Advertising Dept. 216-725-6677 Ext. 220.

Postmaster:
Please send form 3579 to: The A.I. Root Co., 623 W. Liberty St., Medina, OH 44256. Tele. 216-725-6677.

Circulation Figures reviewed by Deloitte & Touche. CPAs.

The A.I. Root Co., Publishers 623 W. Liberty Street Medina, Ohio 44256

VOL 121 ○ NO 5

y '93

FEATURES

Cover
Moving colonies, like these just were, to a new apiary site, like this is, are two topics covered this month. (photo by Roger Morse)

INNER·COVER

The controversy surrounding the USDA's honey loan and subsidy program has not abated, and although they're not grabbing headlines at the moment, the battle to save, or eliminate these programs goes on. I have commented previously on the need to maintain the continuity and balance within the industry if these programs go away. It will be work together, or fail individually.

However, some question the degree of the disaster that would occur, and, in fairness, and for all, let's look at this program.

There are about 125,000 beekeepers in the U.S. And, about 6,000 U.S. beekeepers and importers produce or handle enough honey to contribute to the Honey Board in a measurable way. Further, just over 4,000 U.S. producers (4035, to be exact) used the program in 1991 (you can't get a loan on imported honey).

These 4035 beekeepers received $11.2 million in subsidy payments. At seven cents per pound (average subsidy price) that comes to roughly 160 million pounds of honey – about 73% of the honey produced in the U.S. last year (USDA figures). On average that comes to $2800/beekeeper participating in the program. But that's not the real story.

Five hundred sixty four beekeepers (14%) received less than $100.00 from the government (at most that's 1400 lbs., or 24 five gallon pails, or about two barrels). In fact, one beekeeper received only $2.90. That's not even a 60 put under loan.

The top 261 producers (6.5%) collected $5.5 million (49%). And the top 1712 (42%), who received at least a $1000 each (that's about 14,300 lbs. of honey, or 22 barrels), accounted for $10.5 million (93.3%).

Of course there's some really big players, as in any business or industry. And although they command a lot of negative attention from those who want the program gone, they really are a minority in numbers, if not in honey produced. But this program wasn't designed to look at producers, but rather at what is produced. From the market's point of view there is no difference in 100 beekeepers each selling 1000 lbs. of honey (100,000 lbs. earning $7000.00) or one beekeeper selling the same amount. The market reacts essentially the same. Supply and demand, remember. And there's lots of demand.

Now, what does this all mean. Well, to start with, nearly 2000 beekeepers take at least $1000.00 each out of the program. That money is used to buy supplies, pay the help, pay off loans to banks it's used to keep doing business, whether it's taken right at harvest, or later, when the loan comes due.

Those beekeepers account for roughly $10 million in the program. If you consider the 6000 or so Honey Board contributors the biggest honey handlers in the U.S. these 2000 U.S. beekeepers must be the biggest – producing 150 million pounds of honey – or 68% of the honey produced in the U.S. in 1991. Roughly one third of the commercial beekeepers in the U.S. produce about two thirds of the honey. Not quite the 80/20 rule, but close. When you look at the numbers, we're like most industries, a few big producers and a bunch of smaller operations. So, yes, a very few players make most of the money. Like defense contracts, wheat subsidies and HUD programs. The fact that we're small in numbers is being held against us. I'll bet that the percentages across other farm commodities are similar. So that's what is.

What will be, probably, won't happen for a while, so there's a chance for the big guys to get weaned off the program by working with other credit programs and big packers. The rest will need less assistance than we may have been led to believe, and of course we haven't yet addressed the relationship between the businesses of honey production and pollination.

But, no, the demise of the honey subsidy will not destroy the American beekeeping industry. That destruction lies with the shortsighted politics of those who believe the global marketplace is a level playing field. Balancing the budget is not the primary goal here. And we all know it.

Continued on Page 288

Loan Program Breakdown

Reader Assistance

To subscribe to *Bee Culture* remove or copy the form below, fill it in and return it and your remittance to the address at the bottom. Please allow 3 - 5 weeks for your first copy to arrive. And Thank You!

☐ Please Renew ☐ New Subscription ☐ Send Sample

☐ **2 Years - $28.00** ☐ **1 Year - $15.00**

Foreign Postage — $7.50/year additional for Foreign and Canada.
Find my enclosed check, or charge to my Credit Card.

Name _____

Address _____

City _____ State _____ Zip _____

Please check one.

☐ Visa
☐ MasterCard
☐ Discover

Signature _____ Expiration Date

Send remittance and form to:
Bee Culture, Subscription Department, P. O. Box 706, Medina, Ohio 44258

Subscription Problems. Questions?
Call 1-800-289-7668 – No problem too big or too small. We will help.

ADDRESS CHANGE

If you are moving, please fill in the form below so we can process the change without undue delay. Also, if you have 2 addresses during the year (i.e., winters in Florida and summers in Connecticut), let us know which months you spend where and we can pre-program your address change so you will find us waiting when you move — No Delays, No Fuss!

FOR PERMANENT CHANGE:

Name: _____

Old Address: Street _____

City: _____ State _____ Zip _____

New Address: Street _____

City: _____ State _____ Zip _____

FOR TEMPORARY CHANGE:

Name: _____

Address No. 1: Street _____

City: _____ State _____ Zip _____

Circle Appropriate Months: J F M A M J J A S O N D

Address No. 2: Street _____

City: _____ State _____ Zip _____

Circle Appropriate Months: J F M A M J J A S O N D

Send to: The A. I. Root Co., Subscription Dept., P. O. Box 706, Medina, OH 44258

- *Bee Culture* is available on microfilm from: University Microfilms, Inc., 300 N. Zeeb Rd., Ann Arbor, MI 48103. Second Class Postage Paid at Medina, OH and additional offices.
- Circulation figures are reviewed by Deloitte & Touche Accounting/Auditing.
- We encourage letters to the editor on any subject whether appearing in the magazine or not. Direct your letters to: Editor, P. O. Box 706, Medina, OH 44258. We reserve the right to edit letters for content and length, but will avoid this if possible.

POSTMASTER: Send Form 3579 to:
623 W. Liberty St., P.O. Box 706, Medina, OH 44258-0706, (216) 725-6677 • FAX No.: (216) 725-5624

COMING SOON

The next several months *Bee Culture* has some exciting, profitable and entertaining features in store, and we'd like to clue you into just some of what to expect.

There'll be answers to some important management questions that always come up and aren't covered anywhere else – like handling wax moths. What will happen when Para is gone (and it will be, sooner than you think). Or how about transferring bees from trees (or other odd places) so you can actually keep the bees. Then there's producing comb honey, packaging it and even how to ship those fragile round sections across the street, or across the sea – safely and efficiently.

Then there's removing bees from the sides of houses – that's *really* becoming a bug-a-boo with beekeepers, and the public. We've got a terrific how-to, and it's information *anyone* can definitely use.

Later this summer we've got the perfect pictorial on bees, wasps, hornets – what they are, and what they aren't. This is what *everyone* needs sometime, and our full color self explanatory feature does it perfectly!

But there's the other side of beekeeping. How about all about honey plants? From purple loosestrife (a beauty or a beast?), black locust (maybe the best honey there is?), raspberry (overlooked, but never outdone) and all covered in a down-to-earth style you can use this year, next year and for years to come.

But it's marketing honey that's really got our attention this year, and have we got the best there is in store for you.

Starting with the basics – like the lowly honey label. With the new label laws, and with competition on store shelves getting tougher every day you need every advantage you can get. And we'll give you everything our professionals have to offer. What makes a dynamic label, and how can you make yours work better? You'll only find out here.

Plus effective public relations, affordable advertising and headline publicity – all here, and only here.

Don't miss any of this – *in Bee Culture!*

MAILBOX

■ Sugar Substitute?

I noticed the grocery stores in the Raleigh, North Carolina area are selling a blend of Dextrose, Sugar, and Fructose mixture produced by U.S. Sugar Company in four pound bags. This mixture is being sold cheaper than regular sugar, on a per pound basis. The nutrition label indicates the following:

Serving size – 1 level teaspoon
Servings per container – 552
Calories – 16
Protein – 0
Carbohydrate – 4 grams
Fat – 0
Sodium – 0

Ingredients: Dextrose, Sugar, and Fructose

Product of: U.S. Sugar Company, P.O. Box 549, Buffalo, NY 14240

Is this stuff O.K. to feed to bees instead of regular sugar?

David E. MacFawn
Raleigh, NC

Editor's Note: Our sources say yes, perfectly safe. The reason it is cheaper (probably) is that consumers don't view it as 'pure' sugar. Go figure.

■ Un-Thrilled

I have to agree with Mr. Holden (March Mailbox) when he lists the staff of *Bee Culture* as one of the things in life that we should always appreciate. I certainly do. Your March issue was one of the best yet. Still, my appreciation would be enhanced by a certain ineffable thrill of esthetic delight if they were once again the staff of *Gleanings In Bee Culture*. Our culture in general has been deadened enough over the last few years by the bottom-line bean counters (Richard Taylor's "drift to the drab" says it all): please, don't you be a part of it.

Wm. J. Healy
Hampshire, IL

■ Wax Moth Heat

Please allow me to comment on Clarence Collison's statement that the only approved method for preventing wax moth damage to comb honey is freezing.

In Walter T. Kelley's *How To Keep Bees and Sell Honey* (pg. 69 copyright 1980) it states that all stages of wax worms will be killed at 115°F heat if held there for 80 minutes or at 20°F for five hours. If this is correct, heating seems better as it would also help it prevent granulation of the honey.

David S. Martin
Port Trevorton, PA

Editor's Note: While it may be effective, heating comb honey to 115°F for 80 minutes has several disadvantages: cost, cappings damage, plastic volitiles escaping and the like. Further, fine tuning a kitchen stove to uniformly heat the entire cavity is questionable. Hot, and cold spots occur. We continue to recommend freezing for wax moth control in comb honey.

■ Vitex Source?

Does anybody in the Bee Land know where I could get some Chinese Vitex Bushes?

I found it in an old *Bee Culture*, October 1964. The bushes flower, June the 1st, until killing frost in November. They get as big as 18 feet if planted close enough.

Michael Fisher
4488 Ashville Rd.
Quarryville, PA 17566

■ *Bee Culture* Better

I notice in the March issue of *Bee Culture* several letters complaining about dropping the word Gleanings from the title of *Bee Culture*. I have always been fond of the word itself and even use it in context where it doesn't quite fit. However in the interest of accuracy one could say it never really was an appropriate part of the title of your magazine, which seems to me ought to do more than deal with pieces of knowledge that are left behind, thought to be not worth the trouble to pick up by the harvesters and thus left for the *gleaners*.

John J. McKelvey, Jr.
Richfield Springs, NY

■ Pollen Supporter

I've subscribed to *Bee Culture* for a good number of years and have derived much pleasure and information from your publication.

I was very surprised to see such a negative article in your December, 1992 issue by Dr. Tom Sanford – "Pollen" I have found taking two teaspoons a day for the past three years has been very beneficial for me and for my wife. I have noticed a definite increase in energy and a painful sharp bone growth on my knuckles disappeared. When I stopped taking the pollen while on a three week trip taken a year after starting the pollen, the bone growth reappeared and again disappeared after resuming the daily intake of pollen. It seems to be making a difference in a number of our acquaintances who have suffered the pains of arthritis.

Continued on Next Page

MAILBOX

Pollen is not a drug but a food. In fact, I have read that pollen is the only complete food known to man. It is my experience and opinion that pollen is a valuable, beneficial product. I was under the impression that there have been scientific studies made on pollen. More should be made.

Robert C. Burgolorf
Coos Bay, OR

■ Neighbor's bees

I have a problem with bee identification. My next door neighbor has had a problem with bees entering his new house under the soffitt on two occasions. The first time, April 1990, the bees got behind the wall in his closet. The exterminator drilled several holes in the wall to inject pesticide. He found no honey, not even the smell of honey.

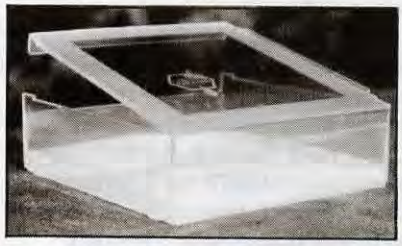
I had received my one hive the previous August and it appeared to me my bees were just getting started. There had been no swarm and the spring had been cool. (We live at 1400 ft. above sea level in Upstate NY.) My contention was no honey – no Honey Bees. My neighbor said they looked just like Honey Bees. I lost my colony in April 1992 and got a new brood chamber in June. In October my neighbor again had problems. This time I saw the bees with binoculars and they did look like honey bees. Since the peak of his roof is 60 ft. high we are working at great distance. Again, I had a new hive building up and from which I had decided not to take any honey. My neighbor wants me to move my hive. What is my best defense? Should I get a field guide for insects to prove my point? Your suggestions would be of great help.

Robert E. Long, M.D.
2807 Citation Dr.
Pompey, NY 13138

Editor's Note: First, you must identify those bees. If they are honey bees, moving yours will not solve your neighbor's problem. If, on the off-hand chance the offending bees originated from your hive (highly improbable, given the circumstances you describe), moving them now would be ineffective. Most likely the intruders have found a convenient nesting site somewhere in the walls, roof or eaves. They may be entering at a site far from the nest, hence the exterminator's inability to locate the nest, or 'smell' of a nest. Your neighbor's best course of action is to find and destroy the nest, then plug *all* the entrances. See the article this month on removing bees from houses.

Of course, if the trespassers are *NOT* honey bees, recommend an exterminator clean up the problem and plug the holes.

NEW PRODUCTS



Cassettes Waxed Better

Mann Lake Supply and Hogg Half Comb Cassettes announce a dramatic improvement in the waxing process of the innovative plastic cassette.

"The new process involves automatically coating the base of each cassette box with a fine spray of wax. This significantly improves the coating because it uses less wax, is more uniform and far more efficient to apply", says John Hogg, the device's inventor. The original process involved wax added to each box individually with a brush, by hand.

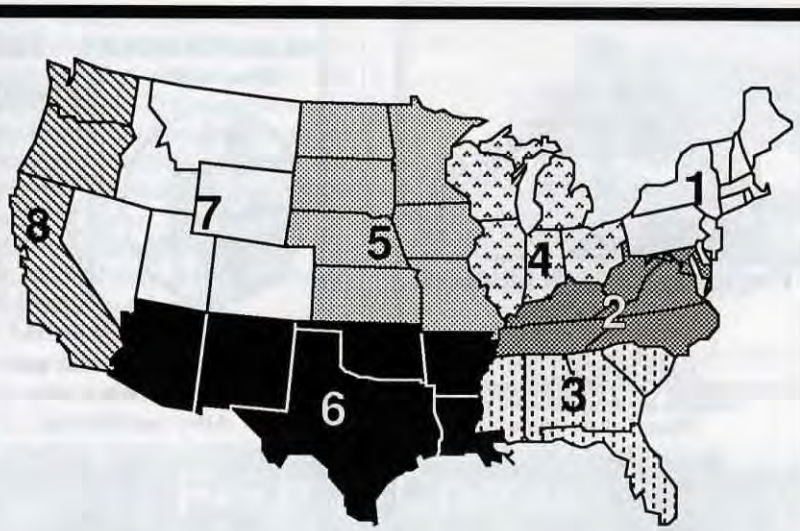
Jack Thomas, president of Mann Lake Supply said that because of this the product costs less to produce, and the savings are passed on to the customer. Cassettes produced using this process are available exclusively from Mann Lake Supply at 1-800-233-6663.

Tie Down Straps and Load Straps

From the makers of KevLok beehive tie down straps (**nine and 12 feet**) comes another new product. A truck load strap with a ratchet buckle for securing loads to trucks. Available in 15' (pick-ups), and 25' (large trucks) lengths, each 1" wide nylon strap comes with either 1" vinyl coated "S" hook, or 1" vinyl coated wire hook fittings. Straps come 2/carton. Call KevLok Straps at 1-800-233-3355.

MAY
Honey Report

May 1, 1993



REPORT FEATURES

Prices shown are averages from many reporters living in a region, and reflect that region's general price structure. The Range Column lists highest and lowest prices received across all regions, from all reporters.

	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8			Last	Last
Extracted honey sold bulk to Packers or Processors									Range	Avg.	Month	Yr.
Wholesale Bulk												
60 #Wh.	46.72	41.37	41.16	37.66	36.90	39.83	43.21	41.07	30.00-55.00	41.44	43.95	44.67
60 # Am.	42.83	38.88	37.14	39.75	35.66	37.98	39.98	38.53	34.20-55.00	39.51	40.84	41.25
55 gal. Wh.	.660	.563	.555	.558	.550	.563	.581	.610	.52-.85	.595	.612	.558
55 gal. Am.	.592	.527	.515	.507	.547	.530	.543	.551	.44-.73	.553	.562	.534
Wholesale – Case Lots												
1/2 # 24's	21.06	22.88	18.88	19.73	16.86	20.40	20.82	22.00	17.35-25.35	20.26	20.26	20.84
1 # 24's	30.63	31.44	26.50	25.92	28.21	30.02	29.87	28.60	16.75-38.40	29.37	30.96	29.22
2 # 12's	27.89	29.34	26.64	28.80	25.70	28.42	28.27	30.14	22.80-36.00	28.28	27.80	28.08
12 oz. Bears 24's	27.91	25.14	24.75	25.90	23.78	25.22	26.59	22.74	15.00-37.68	25.69	26.68	27.25
5 # 6's	31.61	27.95	29.17	31.63	29.04	26.85	28.30	28.35	25.00-38.00	29.35	29.42	29.78
Retail Honey Prices												
1/2 #	1.20	1.15	1.00	1.10	.90	1.19	1.11	1.17	.82-1.29	1.12	1.10	1.12
12 oz. Plas.	1.60	1.71	1.70	1.59	1.42	1.45	1.53	1.29	1.19-2.00	1.54	1.57	1.53
1 #	1.71	1.90	1.65	1.97	1.87	1.85	1.80	1.69	1.39-2.25	1.77	1.79	1.72
2 #	3.22	3.37	3.01	3.27	2.85	2.93	3.35	3.36	2.39-3.98	3.13	4.41	3.04
3 #	4.74	4.06	4.50	4.99	4.89	3.90	4.29	4.49	3.69-5.69	4.28	4.25	4.24
4 #	5.87	5.25	5.45	5.55	5.43	4.90	5.28	5.21	4.29-7.40	5.39	5.43	5.14
5 #	7.39	6.43	6.23	6.91	5.75	5.65	6.33	5.74	5.14-8.75	6.45	6.51	6.72
1 # Cream	2.24	2.45	2.15	1.94	1.96	2.90	2.22	1.69	1.49-3.79	2.22	2.27	2.02
1 # Comb	3.16	2.43	2.88	3.00	3.05	3.49	3.21	3.15	2.00-4.99	3.11	3.07	2.66
Round Plas.	2.24	2.52	2.50	2.65	2.22	2.57	2.59	2.49	1.40-2.89	2.44	2.52	2.12
Wax (Light)	2.46	1.28	1.58	1.50	1.44	2.22	2.31	1.30	1.15-3.80	2.05	1.63	1.72
Wax (Dark)	1.88	1.16	1.30	1.45	1.30	1.53	1.37	1.20	1.10-1.95	1.49	1.28	1.30
Poll./Col.	35.92	20.00	31.66	30.00	32.25	26.00	33.50	31.50	20.00-40.00	30.93	30.39	27.91

MARKET SHARE

The influx of imported honey is slowly showing up on store shelves and in packer's warehouses. The effect, although not yet devastating could be overwhelming. Quality, however, is questionable, and sometimes downright awful. "Grown In the U.S.A." *must* be the rallying cry of U.S. beekeepers. Keep it pure, keep it homegrown!

Region 1

Sales steady, maybe even up a bit, but prices only holding. Some areas seeing significant drop in wholesale prices. Retail about the same. Slow spring holding things back a bit, but catch up comes fast. Winter loses higher from starvation than mites in many places. A positive note?

Region 2

Sales appear steady and prices the same. Local supplies short, and what's coming in is lower priced. Colonies in fairly good shape with mites still a concern, but late spring, wet ground and hungry bees more of a problem.

Region 3

Sales tapering off as weather warms, prices stable, but not remarkable. Cool, wet spring has hindered build-up, slowing orange and Ty Ty in some places. But catch up, will be fast. Untreated colonies still having trouble with mites, but with treatments or build-up normal.

Region 4

Sales soft, prices soft and outlook only moderate. Short crop last year means most local suppliers out, or nearly so, so big packers supplying at much lower prices. Store shelves don't reflect this. Winter losses high, (mites and starvation) and spring late.

Region 5

Sales, and, surprisingly, prices remain strong. Cool, wet spring has slowed build-up in north, but southern areas about on schedule. Winter losses approaching normal, but hot spots still about. Moisture is good and spring flows should be great.

Region 6

Sales steady as weather warms up. Prices variable, but steady overall. Regular to early spring helped build-up and treated bees booming. Comb and cut-comb sales increasing.

Region 7

Sales only steady in the region and prices, while steady, not showing their usual vigor. Colony conditions variable as late spring in some areas has hampered early work.

Region 8

Northern area sales strong and prices steady as late spring kept weather cool. Moisture will help all year. Mite losses variable, some high, some reporting none at all. Southern areas mixed, too. Almond pollination results mixed, colony shortages evident.

JUST WHO ARE THOSE

HONEY REPORTERS?

Take A Candid Look At The Folks Who Help Us Make This Report Every Month

The most controversial feature of this magazine is the monthly honey report. Questions, complaints and compliments regarding the report exceed those received about the editorial (the editor is wrong, the editor is right); the columnists (they're right, they're wrong); advertising (too much, too little); or any other article or piece presented.

The comments range from, "where do you get these prices, mine are never that high (or low)", to, "I never miss the report, it helps me set my prices and lets me know how I am compared to others in my region and the country", to, "since your prices are consistently (high, low), I know where to price my products."

Seven years ago most of the complaints had some basis of truth. The report was sketchy, at best, and often biased toward small scale sellers. That has changed, however. During the past five or so years we have significantly increased our number of reporters, and tailored them to reflect the number of beekeepers, the size of most operations and the type of sales typified for each region.

As a result there are more reporters, representing smaller operations selling at higher prices in region one than region five, for instance.

Conversely, reporters from region five tend to represent larger operations, selling far more in the wholesale area than directly retail.

To formulate each published price, the average of all reports is calculated (the 'Avg' column on the report under Summary). Thus, those on the low side and those on the high side are, in effect, misrepresented. This is compensated, to some degree, by giving the range of prices across all regions, but it is only that, a range.

Short of publishing all reports, perfect representation is neither feasible nor warranted. It is simply a compilation of a representative sample of people who sell honey. However, independent reports, USDA, Honey Board and other price gatherers tend to be similar enough that we are confident in that representation. Use our report as a tool, and not the last word, and you will do well.

But those numbers you read, and hopefully use each month come from real people. Hobby beekeepers, sideliners, commercial producers, producer/packers, a few packers – they are representative of the industry. As a group, however, they are not truly representative of the beekeeping population, primarily because many beekeepers do not sell honey. About a third have fewer than 50 colonies, a third have between 50 and 500 and a third have more than 500.

To help you better understand where our numbers originate, we recently surveyed our reporters and present the results in several tables. Almost 80% of our reporters filled out and returned the 14 question survey. We asked how long they had been reporters, how many colonies they ran, all the ways they moved honey, their age and gender, whether they bought honey to resell, and about their label and advertising techniques.

Table 1. shows the demographics of the reporters who returned their survey. They are mostly male, averaging just over 50 years old. But we have a wide distribution in

Table 1. Demographics of *Bee Culture* Honey Report Reporters

Category	Total	Average	Range
Male	89%	NA	NA
Female	11%	NA	NA
Age	NA	53.1	26-86
Years Reporter	NA	7.2	1-35
Number Colonies	32,800	53.1	0-7000

NA - No appropriate answer.

Table 1. Demographic Average and Ranges of Honey Reporters, by gender, age, years a reporter and number of colonies operated.

Continued on Next Page

Table 2. *Breakdown of Honey Report Reporters by Number of Colonies, Marketing Techniques*

Number of Colonies	All Reporters Percent of Total	Percent of each group who . . . Sell Retail	Sell Wholesale	Buy Honey For Resale	Have Own Label	Advertise Business
0-10	20%	67%	56%	67%	78%	44%
11-50	16%	86%	86%	29%	71%	29%
51-200	22%	80%	90%	40%	80%	60%
201-500	13%	83%	83%	50%	100%	83%
500+	29%	64%	100%	64%	100%	64%
	Average	**76%**	**87%**	**53%**	**87%**	**58%**

HONEY REPORTERS ... Cont. From Pg. 247

age, 26-86 years old.

A few reporters have been with us since the report began over 30 years ago, but most have been with us less than 10. While the number of colonies owned ranges from none (packers only), to nearly 7000 (breakdown in Table 2), the average is just over 50 – a healthy sized hobby or small sideline business.

Table 3.

All Reporters Who Sell	Retail	Wholesale	From Home	Give Away
	76%	87%	67%	49%

Table 3. All Reporters who sell at least some of their honey in these catagories. Many sell in more than one.

Table 2. shows how reporters within each colony grouping sell their honey (more detail is in Table 3), whether or not they buy honey for resale, do they have their own label and do they advertise.

Our reporters do not truly represent a cross section of the beekeeping industry, shown best by the number of colonies operated. While most beekeepers in this country operate less than 50 colonies (80% of U.S. beekeepers, *Bee Culture* survey, 1991), only 36% of our reporters do. That's because, obviously we need reporters who sell at least some of their honey.

Table 2. is informative for several reasons. First, those with the least and most colonies sell the least honey retail, while those in the middle are much higher. However, as colonies increase so does the percentage sold wholesale.

Honey sold for resale deserves a look, too. Those with the fewest colonies buy the most, undoubtedly to shore up their small production. Not shown is the fact that almost 60% of the same group give away at least some honey. Only half of all reporters, however, give some honey away and about a third of that is for yard rental.

Table 4. gives a picture of just how much honey is bought by our reporters. Obviously, the bigger packers and producer/packers purchase the greatest amount, but 77.3% of all honey sold by our reporters has been purchased from other producers, representing just over 6.0% of all honey produced in the U.S., a sizeable sample.

When you look at our reporters in a different way, by the amount of honey they sell, a similar, but somewhat different picture is observed (table 5).

About a third sell less than 5000 lbs. (7-1/2 barrels – a barrel weighs about 660 lbs.) per year, another third sell between 5000 and 50,000 lbs. (75 barrels), the rest sell more. About three quarters of each group sell retail, but selling wholesale and buying honey for resale is predictable. Those who sell little seldom sell wholesale. Selling retail, usually from home, or just giving away are most common because filling pails or drums requires different equipment and marketing outlets, and making money is usually less important than keeping bees. The same holds true for having a label and advertising.

Nearly 90% of our reporters have their own label – (table 4, 5) produced by one of the supply companies (A.I. Root, Kelley, Dadant, R.M. Farms,

Table 4. Honey Produced and Purchased by Honey Report Reporters, and U.S. Honey Produced.

Table 4.

Total Amount of Honey		
Produced by all Reporters	Purchased by Reporters	Produced in U.S. in 1991
12,112,050 lbs.	**9,362,500 lbs. = 77.3%**	**196,035,000 lbs. = 6.2% U.S. Total**

Table 5. *Breakdown of Honey Report Reporters by Amount of Honey Sold, Marketing Techniques*

Annual Lbs. Honey Sold	All Reporters Percent of Total	Percent of each group who Sell Retail	Sell Wholesale	Buy Honey For Resale	Have Own Label	Advertise Business
1000 or less	20%	78%	44%	33%	67%	22%
1000-5000	16%	75%	88%	25%	100%	75%
5000-10000	9%	75%	100%	50%	75%	25%
10000-50000	22%	80%	100%	60%	80%	70%
50000+	31%	71%	100%	79%	86%	79%
	Average	**76%**	**87%**	**49%**	**87%**	**54%**

Custom Label), or have their own design printed.

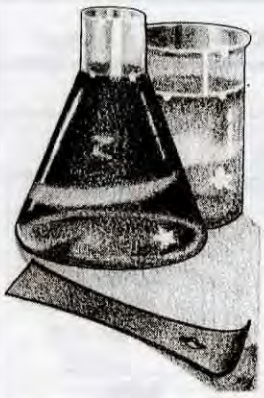
Not surprisingly, those that sell the least retail advertise the least, and those with the fewest colonies advertise the least but, overall only 58% of the reporters advertise.

Word of mouth is the most common form of advertising followed closely by newspaper ads, roadside signs and fairs and show displays. T.V. commercials and interviews are popular as are tourist handouts, business brochures and independent salesmen or brokers. Those are followed by yellow page ads, radio spots, magazine ads, newsletters, posters, shelf talkers and in-store demos.

The monthly honey report is a tool to use to help define your honey product prices. Regional differences are probably the biggest variable in price differences, but the range and average price for each commodity even out those prices.

The other factors, how honey is sold and bought, along with marketing techniques show how our reporters operate, and where your operation fits in.

Use our report to its best advantage, and yours.



RESEARCH REVIEW

roger morse cornell university ithaca ny

"The Tremble Dance explained, finally."

In 1923, Karl von Frisch described three dances performed by returning foraging bees. Two of these, the round dance and the wagtail dance, convey information about the direction and distance to food sources. They have been studied extensively and are well known. The third dance, "the tremble dance", has been a mystery. In fact von Frisch once wrote, "I think it tells the other bees nothing" However, roles played by the tremble dance have recently been identified by Thomas Seeley of Cornell University, in New York.

The following is a translation of von Frisch's description of the tremble dance, which in German is called the "Zittertanz" The bees "run about the combs in an irregular manner and with a slow tempo, their bodies, as a result of quivering movements of the legs, constantly make trembling movements forward and backward, and right and left. During this process they move about on four legs, with the forelegs, themselves trembling and shaking, held aloft approximately in the position in which a begging dog holds its forepaws"

Seeley writes as follows about the dance: "It is shown experimentally that a forager will reliably perform this dance if she visits a highly profitable source but upon return to the hive experiences great difficulty finding a food-storer bee to take her nectar." He continues, saying the dance appears to convey the message that a good source of food has been found and that more food storers are needed.

Under normal circumstances, a foraging bee returning with a load of nectar gives that food to a house bee (a food storer) for further processing before it is placed in a cell. The purpose of this is that the house bee may add more enzymes to the nectar and speed up the conversion of the nectar into honey. What Seeley observed is that if a forager cannot find a house bee she performs a tremble dance. Tremble dances may last only a few minutes but they are usually much longer. Von Frisch observed tremble dances that lasted 45 minutes.

Seeley has a lengthy discussion that I will try to compress into a few words. It has been known that on one day bees in a colony may gather nothing or perhaps only a few ounces of food. A day or two later there may be a major honey flow and these same bees may gather several pounds of honey a day. Since no one bee, or group of bees, is in charge in a beehive, individuals must take action and tell other bees that change is needed. The tremble dance does exactly this. The tremble dance says there is more food coming into the hive and more food storers are needed; it controls the food processing rate in a colony.

The experiments to support the above hypothesis were performed in a remote mountainous area in New York State where there were no other bees and very few plants on which the bees might forage. When a colony carried to this area was given a great supply of food, and food storers were not abundant in the hive and ready to process the nectar, the result was that the foragers performed tremble dances.

This seemingly simple explanation for a complex problem is not the whole story and more experiments are being planned. However, after reading this paper my own thought is that when we observe an animal taking some kind of action there is a reason. That reason may not always be apparent to us but animals are aware of their surroundings and react accordingly. ○

References

Seeley, T.D. *The tremble dance of the honey bee: message and meanings.* Behavioral Ecology and Sociobiology. 31: 375-383, 1992.

? DO YOU KNOW ?

Emphasize Health Management

clarence collison

In recent years, beekeepers and apiary inspectors have devoted a lot of effort and resources to sampling colonies for mites and controlling them. With this increased emphasis on mites, along with a reduction of apiary inspection in several states, and a reported increase of disease incidence in some areas, beekeepers need to re-emphasize the importance of bee diseases in their management programs and increase their monitoring efforts. How familiar are you with bee diseases and the recommended control strategies? Please take a few minutes and answer the following questions in regards to bee diseases.

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

1. ___ Outbreaks of American foulbrood normally occur in the spring.
2. ___ European foulbrood kills larvae faster than American foulbrood.
3. ___ European foulbrood diseased larvae often harbor a complex of different bacterial organisms in addition to the causative agent.
4. ___ Dead brood at the edge of the broodnest consisting of brood of all ages is a typical symptom of chalkbrood.
5. ___ Terramycin (Oxytetracycline HCL) kills both the vegetative and spore phase of *Bacillus larvae*, the causative agent of American foulbrood.
6. ___ Larval remains killed by European foulbrood form scales which adhere to the cell wall and are difficult for the bees to remove.
7. ___ *Nosema apis* spores rarely occur in honey or pollen.
8. ___ Nosema disease is the primary cause of dysentery.
9. ___ Amoeba disease is caused by a protozoan and affects the Malpighian tubules of adult bees.

Multiple Choice Questions (1 point each).

10. ___ Apiary inspection programs in the United States and Canada were established for the purpose of identification and elimination of _____ in colonies.
    A. European Foulbrood
    B. Chalkbrood
    C. American Foulbrood
    D. Tracheal Mites
    E. Sacbrood Disease
11. ___ The killing of colonies and burning of equipment is often used for the control of _____.
    A. Chalkbrood
    B. American Foulbrood
    C. Bee Paralysis
    D. European Foulbrood
    E. Sacbrood Disease

Brood diseases are normally caused by young larvae being fed food by the nurse bees that is contaminated with the infective stage of the pathogen. Please indicate the infective stage for each of the brood diseases listed.

A. Bacterial vegetative cells **B.** Fungal spores **C.** Viral cells **D.** Protozoans **E.** Bacterial spores **F.** Viral spores **G.** Fungal cells **H.** Protozoan spores

12. ___ American Foulbrood
13. ___ Sacbrood
14. ___ Chalkbrood
15. ___ European Foulbrood

Listed below are several characteristics associated with various bee diseases. Please match the characteristics with the appropriate disease.

A. Sacbrood **B.** Chalkbrood **C.** American Foulbrood **D.** European Foulbrood **E.** Stonebrood **F.** Powdery Scale Disease **G.** Nosema Disease **H.** Chronic Bee Paralysis

16. ___ Larvae fail to pupate and remain stretched on their backs with their heads toward the cell capping. Fluid accumulates between the body of a diseased larva and its tough unshed skin.
17. ___ Sick larvae become twisted in their uncapped cells, turn brown and decompose.
18. ___ Caused by a rod-shaped bacterium that forms oval endospores.
19. ___ Affected larva becomes over-grown by fluffy cottonlike mycelia, swells to the size of the cell.
20. ___ Individual bees are frequently black, hairless, and shiny.
21. A certain degree of resistance to American foulbrood is common in some strains of honey bees. A range of hereditary factors/behaviors have been identified that may be present in varying degrees that determine the level of susceptibility or resistance. Please name two of these behaviors. (2 points).
22. Three different techniques are described below that are often used in treating diseased colonies with terramycin. Please indicate which technique is considered to be the most effective method. (1 point).
    A. Mixing terramycin with sugar syrup and feeding it inside the hive.
    B. Terramycin is mixed in fine powdered (icing) sugar and sprinkled over the tops of the brood frames.
    C. Terramycin is mixed with sugar and vegetable oil or petroleum jelly to form an extender patty which is placed on the top bars of the brood combs.
23. Ethylene oxide (ETO) fumigation has been used in a few states to sterilize diseased beekeeping equipment. Despite extensive trials over several years, little progress has been made towards commercial application of ETO fumigation of contaminated hive parts. Give two reasons for this lack of progress. (2 points).

ANSWERS ON PAGE 290

ALTERNATIVE FINANCING

$$

Less Could Be More

bob smith
Director, National Honey Board

President Clinton has proposed the elimination of the honey subsidy. Even if the honey support program is not eliminated, it almost certainly faces an uncertain future. In addition to reduced subsidies, beekeepers face rising costs to operate their businesses.

At some point, beekeepers may need to consider financing for their operations. Some do this routinely. If you have eliminated your friends, relatives and other beekeepers as possible sources of funds, you may need a bank or public lender. In addition to conventional lenders, you may qualify for local, state or federal assistance. You will want to explore all options.

In order to determine which lender is right for you, you need to ask yourself the following questions:

- Am I eligible for this type of loan?
- What information will I need to give to the lender?
- How much can I borrow?
- What is the rate of interest? Is the rate fixed or variable?
- How long will it take to get the money?
- What are the terms of loan repayment?

Whether you use a bank or a government financing program, you will need to furnish a *business plan.* A written business plan tells the lender if you are a good potential investment and how you plan to repay the loan or investment. A sound business plan is a key step in seeking financing.

THE BUSINESS PLAN

Why do you need a business plan? Here are three major reasons:

1. Writing a business plan forces you to take an objective, critical, unemotional look at your business.
2. The business plan is an operating tool that will help you manage your business and work toward its success.
3. A business plan is your means of communicating your ideas to lenders and provides the basis for your financial needs.

There are no hard-and-fast format requirements for a business plan. The length and content will vary depending on how long you've been in business and the markets you serve.

You can obtain help to develop a business plan, but you need to be involved in the planning process. Your insight into the business and your experience are the most important elements. Your first job, then, is to establish and maintain control over what goes into the business plan.

Assistance in how to prepare a business plan and other management assistance may be obtained from the United States Small Business Advancement Centers, state university small business advancement centers, local colleges and community colleges or private management and financial institutions.

COMMERCIAL LENDERS

Commercial banks provide about 40% of farm loans. Banks and savings and loan institutions provide the vast majority of financing for operations or capital equipment purchases for small businesses. If you purchase equipment, the bank has something to sell if you don't repay the loan – collateral. A real estate loan provides cash for the land you own. Again, the bank has collateral in the form of land. Operating loans for beekeeping operations can be difficult to obtain because the bank may not want to accept your honey crop as collateral. However, there are some options for short-term operating loans you should discuss with your banker.

Most beekeeping operations can run on short-term loans. The honey loan program works like a short-term loan. Technically a "short-term" loan means financing for less than a year. In practice, though, short-term loans expand to two or three years. Most short-term loans fall into one of five classes. Following is a short description of each. .

LINE OF CREDIT A line of credit is a specific sum approved by the lender for a company to draw on, as needed, over a prescribed period. Repayment is tied to the sales of anticipated products or services. Interest is computed only on the amount drawn, but a commitment fee may be imposed. A commitment fee is a 1/2 to one percent fee charged by the bank on the amount drawn.

Lines of credit are popular because they are simple. The cheapest

Continued on Next Page

FINANCING ... Cont. From Pg. 255

interest rate is the *nonbinding line of credit.* This may be your best buy if you're willing to risk that the line may dry up. Because the bank does not guarantee it, your credit may be cut off if your company is in trouble or the beekeeping industry seems headed for hard times.

The risks of losing the line can be avoided by paying a premium in interest to insert the word "committed" in the loan agreement. Committed means the bank has an obligation to continue your line of credit.

Nonbinding or committed, a short-term line of credit must be "cleaned up" periodically, under most banks' rules. You must be "out of the bank", or fully paid up for 30 days a year.

If cleaning up a line of credit will constrict your cash flow, you may consider a third type – the *revolving line of credit.* This type requires an annual review and renewal, but no clean up. This is similar to a revolving charge account: As you withdraw funds, your available credit is reduced, and as you repay, it is increased by the same amount. Interest is computed only on the funds actually borrowed and there are no additional costs.

INVENTORY LOAN Inventory loans are convenient for seasonal business – like honey production. If you want to borrow $25,000 to $200,000, some big banks may not want to give you a formal line of credit. Instead, they may write what they call "short-term loans to carry inventory" The bank's collateral is the honey itself. From your point of view, an inventory loan is just like a line of credit. Funds are made available to be "taken down", or borrowed, as needed. Repayment is made in installments as the honey is sold and receivables are paid.

The usual inventory loan runs six to nine months, and requires the same 30-day annual clean up as a line of credit, if you want an extension.

COMMERCIAL LOAN Some big banks prefer to make commercial or "time" loans because they minimize bookkeeping for the lender and the borrower. A commercial loan is simply repaid in a lump sum at the end of the term, typically three to six months. With this loan, the chief concern is how will you amass the lump sum to meet the obligation.

ACCOUNTS RECEIVABLE FINANCING Accounts receivable financing converts your unpaid customer accounts into fast cash.

Which accounts and how much? Generally, accounts must be less than 60 days past due, and your customers themselves must qualify as credit worthy. For receivables meeting these criteria, banks will advance 65 percent to 80 percent of the total amount your customer owes, repayable as your buyer's checks come in. The usual arrangement requires you to pass on the checks to the bank, which takes a portion and deposits the rest in your account. Interest is charged only on the amount outstanding.

FACTORING This may be the oldest method of commercial lending. Factoring is a variation on accounts receivable financing. The bank (or a factoring company) buys the receivables outright. Importing industries are among the major users of factoring services today.

When receivables are purchased by a bank or factoring company, ordinarily you're no longer involved. The bank assumes credit risks and takes on collection responsibilities.

There are limits to factoring. The bank subjects receivables to rigid scrutiny to screen out the poorest risks before making any purchases. Further, your costs may be quite high. The bank will *discount* or deduct interest from the value of the receivables before advancing the cash to you. Often, in fact, these discounts or interest rates are higher than in most other forms of short-term financing.

Banks want to lend money. It's their main product and small businesses are some of their best customers. But lenders aren't going to come to your door and hand you a check. They still have to cope with both federal and state banking regulations, traditional lending standards and a desire to keep funds they lend from getting beyond their control.

It's a good idea to develop and maintain good relations with your banker. You need to

1. **Keep your banker informed.** Send all audits, monthly statements, annual reports, press releases, letters of quality assurance.
2. **Meet with your banker.** (Try to visit on a day when you haven't used Bee Go.) Meet at least twice a year to discuss your plans, your financial situation and the beekeeping industry in general (consider bringing in supportive documentation).
3. **Invite your banker.** Invite him to your open house or to local beekeeping meetings. Even if the banker doesn't attend, it will show you appreciate his need to know about your business and the industry.
4. **Remember** – Your relationship with your banker is a key one, but don't forget that they are selling you money and they want to do business.

Preparation for the transition between federal subsidies and bank loans begins now. Check out different lenders, prepare a business plan, and know what to do.

OTHER SOURCES OF LOANS

There are several government programs which supplement private sources of financing. These programs may be able to improve the availability or terms of private financing for businesses which meet the requirement of a program.

The Small Business Administration and the Service Corp of Retired Executives help small businesses with financial planning. You will need to call the SBA or SCORE office in your state. SCORE counselors are volunteers with a broad range of business expertise and willingness to help small businesses.

If you are interested in obtaining an SBA loan, you should meet with

your banker and be prepared to provide the following information:

- Cash flow projection
- Personal financial statement
- Personal resume of experience
- List of what the money is to be used for (inventory, working capital, etc.)
- Financial statements for the past three years

If your banker is interested in making an SBA guaranteed loan, you will receive a set of SBA forms to complete and return to the bank. The banker will send the completed forms to the SBA. The bank will determine the interest rate and loan terms. If the SBA approves the loan, the bank will advance the money and you will repay the bank just as you would any other loan.

The Farm Credit System makes about 25% of farm loans. The Farm Credit System includes the following institutions

- Federal Land Bank
- Farm Credit Bank
- Production Credit Associations
- Agricultural Credit Associations
- Federal Land Credit Associations
- Cobank National Bank for Cooperatives

These institutions usually require payment of a membership fee or the purchase of stock. The membership fee is on deposit and will be refunded when you leave the association. Again, you need to find out which lender meets your needs. For example, the Federal Land Bank only makes real estate loans.

Production Credit Associations may be the best bet for beekeepers since they make operating loans. PCAs will require the basic information included in the business plan: three to five years' tax returns, current balance sheet, income statement records and a projection of operation.

The Farmers' Home Administration makes operating loans to family-sized farms which are unable to obtain credit elsewhere.

If you now use the federal loan program, or will require additional financing in the near future a lending institution of some type will come into play. It may be a year, or two, before the government program goes away – if ever. But preparation now will help insure a smooth transition. Get a business plan together, investigate different lenders and know what to do, before you need to do it.

MARKETING

Where Is My Business, Where Do I Want It To Go, How Will I Get There?

walter clark

You may be in beekeeping to make a full time living, a side income, or simply to have your hobby pay for itself. The size of your business, your personal interests and availability of local markets all have a bearing on whether or not you have the resources to produce, package and market your products. In any case, beekeeping is a product-driven business, and how you make your living with those products – producing, packaging or a combination – is up to you. But to make a living products must be sold and markets found to sell them in.

Any beekeeper, large or small, needs to sell substantial quantities of honey and hive-related products to make a living. To do so, the challenge of finding new customers and markets while making a reasonable profit must be met. Meeting that challenge is the goal of marketing.

What is Marketing?

Although related, marketing is a separate and distinct process from honey production, packing or general record keeping. Marketing is 1) understanding how products and their markets (consumers) interact, and 2) the commercial delivery of goods and services to meet the needs of those consumers. Marketing is not just "promotion", but includes the associated roles of sales, advertising and publicity. Marketing is the final process that brings honey to the table of every American and the one component that delivers the product to the consumer. Knowing how to run the beeyard is essential to success, but in the end marketing is the only process in a well-run beekeeping business that can sustain profitability. The process of marketing is really a combination of unique elements which are the subject of this article.

Effective Communication

After the work in the beeyard and honey house is over, marketing the product is the next step. if you produce, you must market.

The purpose of marketing is to grow your business by putting yourself in front of the customer. This involves a whole range of activities, from getting the bottle on the store shelf to finding the end-user of bulk honey. Whether retailing or wholesaling, both require creating a demand for those products.

Are you interested in selling bulk honey to a specific market . . .

Most of us know that to efficiently run our beeyards means to develop a seasonal plan for locating nectar sources, preventing disease, maintaining equipment, increasing hive populations, careful supering, and all the rest. To efficiently communicate with the buying public requires similar tactics. This is accomplished by developing a marketing plan and putting it to work – step-by-step.

Setting Goals

Surprisingly, many beekeepers, who agree that the end result of their business is to sell their product, do not have a marketing plan. To sell your beekeeping products it makes good sense to evaluate and outline what you are presently doing, how you would like your business to grow, and the extent to which you intend to grow it. This is accomplished by setting goals.

To start a marketing plan use a pencil and paper and put a few good ideas into action, (with the emphasis on action!). A marketing plan therefore must be more than just a pile of newspaper articles on honey promotion, pencil-sharp bookkeeping or good intentions. A marketing plan is primarily goal setting.

Starting Your Plan

The first step then in creating a marketing plan is to ask yourself three basic questions: 1) Where am I? 2) Where do I want to be? and 3) How do I get there? To develop a workable marketing plan requires analyzing yourself and your markets, then developing a plan based on that information. And finally, systematically carrying it out.

Where Am I?

Where your business presently stands and what direction your marketing plan will take begins with a realistic financial profile. In general, how is your business health: Can you pay the bills? Are you making a profit? Do you keep accurate books? Do you know the cost of per-hive production, labor and the overhead required to reach the final product? Can you adjust for inflation, bad crop years, winter loss, competitive markets and loss of customers or pollination contracts?

If you are making a profit, consider: Do you save the money you make or immediately spend it? Do

you have a little "honey money" stashed away for expansion plans? Answering these questions will help you appraise the strengths and weaknesses of your business and provide the foundation for a good marketing plan.

Undercapitalization

More often than not, we run out of money at the wrong time, with no supers for a great honey flow, or with potential customers knocking at the door. Undercapitalization is one of the first problems encountered in keeping a business successful. The beekeeping industry is filled with numerous shoe-string budget operations that have no plan for balancing their budgets and subsequently no hope for growth. Finding out where you stand financially can at moments be frustrating, but it can also empower you to make the right decisions when money needs to be made, spent or invested.

Commitment to financial stability cannot be overemphasized for again, it is an essential ingredient to building a marketing plan. If you don't develop a profile your seriousness is questionable.

If your credit is good and you have a solid business plan, capitalizing your business may be an option. Although the financial components of successful small business are related to marketing, this is a subject for another time. And as a very successful honey producer I know says, "Let the bees pay the way"

What's Different Is What Sells

Our industry's ability to produce extracted honey has captured the fancy of beekeepers for more than a century, and has provided a singular way to make a living. But as production costs rise and with the impending loss of government support programs, this system will weaken. In addition, producing bulk extracted honey and competing with the millions of pounds of both domestic and imported honeys already on the world's market shelves will become increasingly more difficult.

The reality of today's market dictates that in addition to extracted honey, we also offer a variety of unique products or distinct services that make us stand out from the competition. This is called the customer benefit. In other words, what's different is what sells. By having new and different products (or customers), you have the tools to better compete and maintain an income.

. . . or a specific product to the public at large?

So the question is, are you interested in selling a commodity (bulk honey) to unique markets, or a unique product (specialty items) to the public-at-large? Planning ahead to market to specific customers with specific products will determine whether or not you'll sell your product. This will alleviate a lot of potential headaches that producing what's already available, such as liquid extracted honey, or getting ahead of the demand for it, can bring.

If you decide not to find unique markets for extracted (bulk) honey, then focus on producing a specialty product. Items such as comb honey (for which the supply never seems to meet the demand), specialized floral sources, nut or fruit enhanced creamed honeys, or any number of manufactured uses for your product will open up new territory. Here is where all of the best packaging techniques and finding the particular needs of your customer base come into play.

Finding the customer to match your product will take some work, but first the buying public needs to know you're there. With some creative research a pent-up demand for honey can be found in many businesses. Chefs, store and shop owners (among others) are experiencing an increased demand for higher quality, natural ingredients like honey, yet have no source to turn to. Businesses which are currently looking for a constant supply of honey include gourmet, foreign, natural, or imported food stores; gift shops; restaurants, hotels and resort facilities; bakeries; meaderies, wineries and micro breweries; catering services; institutional kitchens (hospitals, colleges, schools, retirement homes) and specialty shops – that make only cheese cakes or sell just coffee and tea to name a couple. Many of these may use 60 to 2000 pounds of honey a month depending on the products they sell or produce.

Narrowing the gap between what you produce and what customers know you produce (their specific need), determines how they perceive you and ultimately what you sell. This product-perception relationship is called positioning.

Where Do I Want To Be?

Early in the development of your marketing plan decide on your mission statement, answering: what am I producing and who am I going to sell it to?

Where you will be is determined by positioning yourself. Positioning determines what products you sell, how you sell them, and to who it's controlling a segment of a given market. Are you only selling at farmer's markets or from your back door with a limited crop each year, or do you have a regular retail customer base you serve by selling to grocers and other retailers? Or, are you packing and selling to just bakeries and institutional users of honey? Holding these markets with the products you produce and sell is called your market position.

By establishing a strong market position, some national and regional honey packers have become household words over the years – practically everyone knows "Sioux Bee" brand honey. On a smaller scale, maybe you pack several varieties of honey from specific nectar sources for the tourist trade, or you have a reputation for a consistent supply of icey-white section comb for grocers. Or, you add value to your honey by producing a honey-based mustard or bar-b-que sauce. Market positioning is closely tied to brand recognition. Brand recognition is held in place by using unique labeling and packaging.

Positioning is primarily knowing your customer's needs. Why do people buy from you? For example, some manufacturers and bakeries value particular types of honey. Ready-to-eat foods are enhanced by a white to clear honey, whereas baked goods

Continued on Next Page

MRKETING ... Cont. From Pg. 259

often have a fuller flavor and aroma using a darker, amber type honey. On the packaging side, gourmet food shops probably don't want honey bottled in pint mason jars, whereas tourist shops might find them appealing. Strong positioning is a major component in deciding what to produce, how to produce it, and who to sell it to. Whatever the mix, it always depends on meeting the customer's needs.

Supply and Demand

In addition to positioning the "Where Do I Want To Be?" question should also include an analysis of market conditions, a basic evaluation of supply and demand. Supply is the amount of product available in your area; the demand is the potential number of buying customers in your area.

How far you live from customer areas, or if you live in town, what section you live in, can give you a head start on establishing a customer base. Finding the exact location of this customer/competition ratio is your "trade area". It's the exact spot on the map from which you draw customers and face competition. Knowing it will give you a head start on establishing the area you will market to.

Demographics: Customizing Your Customers

Customizing your trade area is easy. If you are involved in one-on-one salesmanship, keep a list of the names and addresses of all of your customers, sort them by zip code and use this list to determine where they are concentrated. Knowing the size of your trade area lets you know where your customers live and how far they range. Doing the same for your competitor's products also helps. Know who else is doing what you are, and where they are doing it.

On a broader scale, another way to customize your trade area is by knowing population and educational profiles – the demographics of your chosen area. A decent library can give you these statistics. Check out the 1990 census data. It is specific to streets. Knowing the population and educational profiles of your area gives you better control of your market's environment. It will give you an idea of how many residents there are and where they're located and act as a body of information for developing your advertising, educational brochures and materials. Knowing how your customer probably thinks when he or she sees your label or informational materials will help you decide how to present it. The National Honey Board's recent study of labeling, its psychology and effects on consumer behavior can provide some great insight into this subject.

Marketing Plan

I. **Major Strategy or "Mission"**
(State in two or three small paragraphs the major strategy for your marketing plan.)

II. **Marketing Objectives**
(State the marketing objectives that you will accomplish through positioning, and establish supply and demand parameters in your locale in five or six bulleted statements.)

III. **Proposed Actions**
(List actions to be accomplished over time to reach objectives.)

IV. **Effects of the Marketing Plan**
(List overhead costs, proposed costs, strategies, objectives and estimated profits.)

How Do I Get There?

Now your marketing plan must be outlined into a set of specific goals, strategies and actions. As we have discussed, one of the critical elements of this plan is evaluating your present profile and determining whether you can increase your business from there. Write out the short and long term objectives of your marketing plan. Have you analyzed yourself and your markets? Have you decided on your mission statement: what will you produce, how will you produce it, and who will you sell it to?

Next, set specific objectives for increasing the specific markets you want to sell to. Be exact: target your market, state what your specialized product is, give a specific customer benefit and establish a time frame. Short term objectives are usually 30 days or less; long term can be divided into three, six and 12 month periods.

State your objectives, such as: "I'm going to sell 25 barrels of orange blossom honey to 15 bakeries, restaurants and grocery stores in the next 18 months," or " I will sell 100 barrels of light blend to six manufacturers, packers and wholesale buyers within a 200 mile radius by 1994," or "I am targeting 25 new restaurant customers in my area to provide them all with both dark cooking honey and light table honey by mid-July," or "I will develop new markets for 500 sections of comb honey through gift shops in three nearby resort towns in 1993."

You may have several objectives in your mission statement covering different markets, customers, products, and sales goals. Your action plan may take the form of a table or a calendar with various activities dated, and in columns and rows. This helps create a framework for your actions, provides perspective on their do-ability, and will help you adjust as problems or opportunities arise throughout the course of your work.

The importance of developing successful marketing strategies, on both the local as well as the national level, cannot be over emphasized. Other agricultural commodities can attest to this fact with their promotions, such as the pork industry's award-winning "Other White Meat" campaign. Similar campaigns have been and are being developed by our industry's own Honey Board.

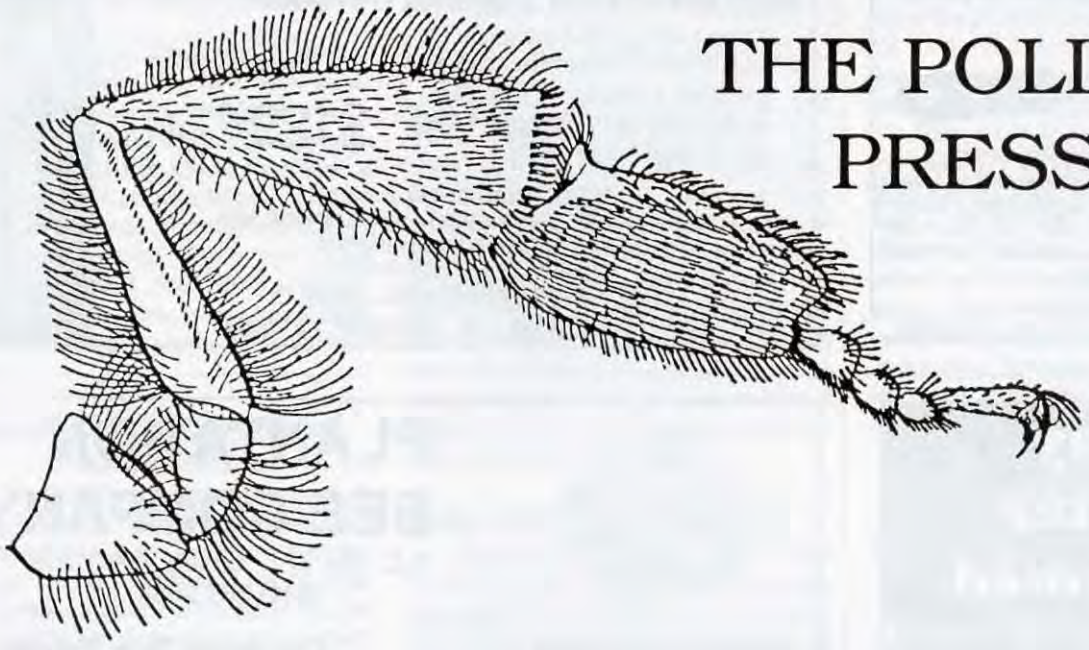
Let the bees pay the way.

Walter Clark is a beekeeper & public relations expert for a banking organization in Des Moines, IA.

by
Lynn Royce
and
B.A. Stringer

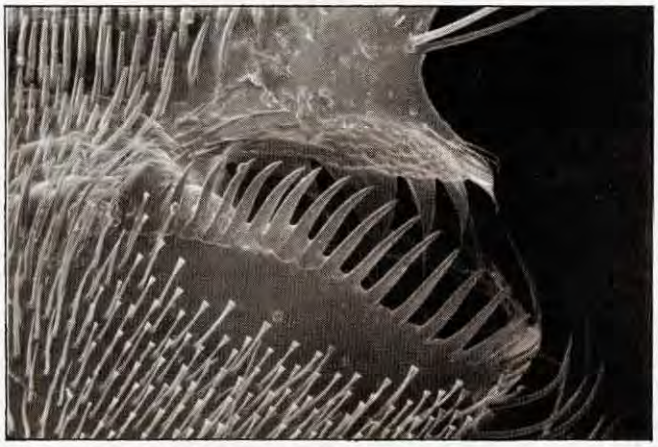
Up Close And (very) Personal

THE POLLEN PRESS



The hind leg of a honey bee. Note the single hair, which acts as a pin.

Some of the hairs used to comb pollen.



The pollen press.

A single grain of pollen from False Dandelion.

Through the flowering periods of the year, honey bees bring in large loads of pollen on their third pair of legs, "saddlebag" style. Propolis is also carried in these baskets.

Bees become dusted with pollen, their major protein source, whether or not they are specifically foraging for it. The loose pollen grains adhere well to the feathery branched hairs of the bee's body.

The bee's front pair of legs are equipped with blunt-haired pollen brushes which are moistened by regurgitated honey or nectar. As the bee grooms, dry pollen grains are made sticky and clump together, in much the same way as a wet mop settles dust. From the front leg brushes, the clumped pollen is scraped onto the basitarsi of the second legs, then transferred to similar brushes on the hind legs. When these hind leg brushes become loaded with pollen masses, a remarkable mechanism called the pollen press compresses small pellets of pollen and squeezes them upward into the pollen baskets, or corbiculae. Let's take a closer look at how this process works.

On a worker honey bee, the tibia of the third pair of legs is equipped with a basket called the corbiculum. It consists of a broad concave surface edged with long incurving hairs. As can be seen in the electron micrograph, there is a single hair protruding from the smooth center of this basket, which acts as a pin to secure the pollen load. The wide end of the corbiculum abuts the joint with the next lower leg segment, the basitarsus.

The basitarsi also bear specialized structures for pollen collection. On the inside of these leg segments, there are hairs of different shapes designed for combing; some are short and thick like rake teeth, some have blunted or bulbous tips. Looking at a straightened bee leg, these combing hairs are on the insides of each leg, while the corbiculae are on the outside, like saddlebags. For pollen to pass from the loaded combs to the corbiculae, it must first go through the pollen press.

You've probably noticed honey bees hovering near flowers rubbing their hind legs together. These worker bees are moving pollen through their pollen presses and loading their corbiculae with the pollen pellets.

At the top edge of the basitarsus, close to the joint with the tibia, there is an angled depression (the auricle) surrounded by stiff spines. Above this cupped area, on the lower edge of the tibia, are rigid rake hairs. When the bee moves one leg down past the other, the rake hairs comb moistened pollen from the loaded basitarsal brushes. The pollen then becomes trapped in the cupped depression of the auricle, in the joint of the leg.

As the bee straightens the leg, the pollen mass is squashed between the tibia and the basitarsus, held in by the stiff spines rimming the auricle. The only place where the pollen can be squeezed out, is on the other side of the joint into the lower end of the corbiculum.

The corbiculae are loaded by alternate scraping and pressing from each leg, each successive pollen addition being squeezed through the press and upwards into the basket. The single hair in each corbiculum anchors the pollen mass and allows some extremely large loads of pollen to be carried. When the pollen collector has both corbiculae filled, she returns to the hive and disengages the pellets on a pollen frame. ○

Swarm Calls

o.b. wiser

The anticipation of the swarm season makes the long, long days of January a bit more bearable. I would like to share with you some of the most memorable swarm captures I have made over the years and during some of these, of course, I learned what *not* to do when catching swarms.

As a boy of 12 I dreamed about huge swarms hanging on convenient branches of maple trees. I pictured myself dressed in pure white coveralls and veil, gently shaking the branch as the bees, every last one, fell into the newly painted super with bottom board, with 10 brand new frames of foundation all carefully strung tight with wire. I tried, on my first swarm call, to make my dreams come true.

The rain had just stopped falling the seventh of May when the call came from a local honey company. My heart raced a hundred miles an hour. I had *swarm fever*. My name had been placed with the honey company, the fire department, and the police department, whose chief was a family friend.

It was like a fire drill come true. I was the fire alarm, running about the house telling everyone what to do. I ran to the garage for my smoker, bee tool, and brand new full depth super with foundation and brand new top and bottom. My coveralls – well, I had not earned enough money to buy such a luxury, yet.

All materials were rushed to the waiting 1959 VW bug and stashed in the back seat. All the information I had was there was a swarm at an address near State Street. I had heard the word swarm on the phone, asked the address and hung up. *Not a good idea!*

I arrived at the swarm scene to meet a small crowd of neighbors all looking up at a dark mass hanging 20 feet above the road. The road was littered with dead bees below that had been hit by cars. My first expectation was shattered. I could not reach the swarm, as planned.

Continued on Next Page

Swarms like the two on the left are better left alone. They, and those 100 feet high are usually more work than they're worth. But those that are hanging on low easy to reach limbs those are what we dream of.

SWARM CALLS ... Cont. From Pg. 265

Not being one to quit, I asked for a ladder from the interested crowd. One was produced that reached into the elm tree just below the swarm. Now how was I going to hold the super and frames, crawl up the ladder, stand on the top rung , shake the bees into the waiting, loose frames of foundation? Not knowing the impossibility of the task ahead of me, I somehow managed it, with great risk to myself, the bees, and the crowd. I hung like a monkey, with arms and legs grasping the tree limbs, while I somehow pushed the box up into the swarm. The behavior I next noted goes against everything I have since learned about swarms. The bees at once vacated the limb, without being shaken, and entered the box of foundation. This is *very* atypical behavior and I have to consign it to the rating of a miracle.

I made it down the ladder and sat the box in the middle of the road, waving all traffic around those precious, swarming bees. I had stopped traffic for one hour, had people yell at me, and managed to get a few people stung. Then the climatic moment I had envisioned in my dreams came to be – the triumphant removal of a large swarm of bees. I smiled, waved my hand, and tucked the new hive into the back seat of the VW bug.

My 17 year old sister Chloe waited for my command to make the drive home. Chloe did not have a veil and I had taken mine off. All was quiet, not a bee was stirring. The entrance was open; the lid was new wood against new wood.

We got one mile down the road when a car interrupted our Cinderella chariot and a quick braking was required. The bottom and the lid both simultaneously slid off the super and bees began bouncing off the windows like hail. My sister tucked her head down and pulled over. We both left the VW from opposite doors, being nearly hit by the oncoming traffic. There we sat in the outside lane of a four lane main artery, bees flying about the inside of the VW bus, motorists slowing to stare at the expected accident. What more could I do wrong?

A beach towel, given in pity from a motorist, saved the day. After smashing hundreds of bees inside the car so my sister would get back in, we were finally on our way again. Five hours after reaching the swarm scene, we arrived back home, where the bottom dropped off the hive in transit to the hive site and bees crawled up my legs. I realized I did not know how to catch a swarm.

Four years later, I was basking in the sun at our club's swimming pool when over the loud speaker a booming voice announced, "We have an emergency swarm call for O.B. Wiser."

I stood up, put my thongs on, and casually walked out of the pool area to the same VW bug. Since that first swarm, I had caught at least 100 swarms and now had 60 hives. No sweat, I said to myself. Luckily I had left my now well seasoned cardboard box and towel in the back seat. That cardboard box had picked up 30 swarms, it smelled like bees and even had spots of white new wax deposited on it. This bee smell is very important.

I did not have my veil, bee suit, or any clothes. Just my swim suit. I was a cocky 16 year old that late spring day, with a new driver's license who thought he had seen it all.

I arrived at the home of the Police Chief's mother just after 2:00 p.m.. I was casing the swarm scene carefully, noting vital information needed in the hoped-for-capture. First, the Grandma was a busy body, wanted to be in the middle of everything. She would not go in the house. The swarm was 30 feet up in a huge willow tree, with branches the diameter of most trees. It was a snap, I thought. The swarm was just above a branch I could have build a tree house on.

There was no ladder so I had to shinny up the wide trunk in my thongs. No problem, I was half monkey by now anyway. The swarm and the 18" X 20" well-used cardboard box were about to meet. Only one slight problem, the swarm was four feet to the side of the limb. I had to lean far to the right to reach the bees. No problem. Carefully, I straddled the branch in my swimming suit and wrapped my bare legs about the huge branch as I tried to tell Grandma to go in the house. She refused.

The swarm was prime – at least 10 pounds. As I took a deep breath, I leaned out as far as I could with the box in one hand, while I held on with the other. *Cardinal rule #1, Always have one hand holding on to the tree for yourself.* The swarm barely fit the opening as I lifted the box like a pillow case around the pounds of bees. A quick jerk of the box and the swarm was totally disengaged from the large branch. In the split second that followed, my mind took in all the possibilities about to happen.

The swarm was bigger than 10 pounds – wonderful. The grandma was directly beneath me, head kinked back, mouth open wide. But most important, I knew I could not hold my position as the weight of the swarm was too much to hold. Gravity's reality would totally overcome my plans. But the grandma was right below me – the Chief of Police's mom. My very best source of swarm calls was hanging in the balance.

All this flashed through my head in an instant as I began to slip and fall. My legs scissored the tree like a python. I instantly used my whole arm to grasp the tree limb, while my right hand clenched like a vice onto the cardboard box bending the edges. I would not drop that swarm no matter what! The next thing I knew, I was hanging upside down from that tree limb. Grandma was watching my every frantic move. My inner legs were scratched raw as I made the 180° swing. But I held – youth and determination held.

Grandma's mouth opened and asked if she could be of help. Breathlessly, I gently spoke. Please go over to your back porch. I'm just fine. With that she moved and I proceeded to scrape the rest of the skin off my legs as I creeped along the branch and somehow got my swarm box to the ground.

I have learned a great deal the hard way. First, catch swarms in cardboard boxes with fold-in tops, and take a towel along to put over the top. Often, the weight of the bees hanging on the top will collapse the lid inward, but the towel will keep them in. Make it a big towel.

Go prepared for the worst, take a veil, coveralls, smoker, hive brush, and, most important, ask lots of questions over the phone. Questions like how big is the swarm? Is it the size of a softball, football, basketball, or larger? Where is it located? How long has it been there? Forget going to the small ones or the ones on the sides of houses or in the crotch of a tree. They have already found their new home.

Do not try and take bees out of buildings, sheds, or trees. Of all the attempts I have made (and I have tried many), not one capture

amounted to a hill of beans. They are not worth the time and I have never made a pound of honey from one. When a hive-in-a-home call comes in, I simply say I am not interested in the bees and tell them how to eliminate the problem. If they want me to do the dirty work, I charge plenty. *Forget wild hives.*

Swarms should go into pulled comb. Pull out the middle five frames, dump the bees in, let them spread out, and then replace the combs. If you have some extra brood, add it in the box before the swarm is dumped. I wait five minutes and put the top on, letting the bees find the entrance.

When catching swarms, I will only stay abut a half hour. You cannot catch all the bees. I leave instructions with the home owner to wait until dark and come out with a hose and soak the remaining bees with cold water, washing them off the spot they have been in. I never return to pick up the "second swarm." I make it clear I will not be back.

Once I had a gruff home owner request payment for the swarm – one I had risked life and limb for, climbing his 100 ft. thorn tree. I didn't say a word as I offered the box of bees to him. I just said, "Well, here's your swarm. I don't pay for swarms." (The bees were crawling all over the box.) That will be 10 bucks if you don't want it left on your front porch." I got the swarm and the 10 bucks.

Swarm catching can be exciting and it can be dangerous. It helps to be in good shape and know mountain climbing techniques. It is not for those who are not sure footed. Today, my bees seldom swarm because I divide them on schedule. But Springtime is never without the excitement of a few *SWARM CALLS*. I go well prepared and leave the high ones for the younger generation. And I learned that the hard way.

REMOVING BEES. I

charles martin simon

Once bees have taken up residence in a building there are two ways to remove them. In the first, the structure is not disturbed. The bees are persuaded to move into a proper hive. In the second, the structure is taken apart, and the bees are removed manually and installed in a hive. We will deal with the first method in this issue and discuss the other in a future article.

The best time to remove bees is during a honey flow, but it can be done successfully any time between early spring and mid fall.

Be prepared to give it six weeks. I read that you could do it in two, then kill off the remaining bees, seal up the hole, and be on your way. But that is the wrong way to go about it. You run the risk of killing many bees, including the queen as well as leaving dead bodies, honey and pollen in the wall, which will attract vermin, possibly melt down and cause damage. Even with the structure sealed, a sizable amount of honey will attract bees for years and they can chew through wood if they have to.

To be successful give it enough time so the removal will be complete and the cavity will be left clean.

Take a good look at the situation first. Even if things seem calm. Make sure you locate all entry holes. Select the most appropriate and seal the others. This can be more difficult than it sounds, especially if you happen to be working hanging out and over at the top of the ladder, and you have to go up and down several times to move and reset it.

You will need a prepared hive. I usually use eight-framers for this, configured as follows: One comb of brood with *very few* adhering bees, to avoid massive battles with the incoming wall bees. (I have seen the bees from a single comb of brood fight wall bees so effectively that the latter gave up and, demoralized, clustered on the wall near the hole. It was a standoff. And remained so for more than a week. The cluster, unable to get back into the wall, unable to enter the hive, grew larger – until I finally took out the brood frame and replaced it with a fresh one without bees. The wall bees then marched right in.) This brood comb should be taken from its parent hive during the middle of a warm day and installed in the removal hive as soon as possible. If there is going to be a delay – because of travel time for example – it would be best to bring along a lot of adhering bees to cover the brood, and brush them off just before the hive is set in place. (They might find their way back to their comb in the removal hive; by that time the wall bees will have taken over, and there will be no conflict.)

The funnel. Note the wide part is over the only *entrance you've left. The narrow end, about one+ bee wide is close, but not too close, to the entrance of the new box.*

In the removal hive, place the comb of brood between two frames of empty comb and as close as possible to the opening in the wall. The rest of the hive is filled with empty frames. In the past these frames would have contained foundation. But I don't use foundation anymore, so they would be empty SUPERFRAMES™, which I use both because they are my product and because they work better for me than anything else. I do not want these five frames to contain comb so that the bees moving from the wall have work to do.

Depending on conditions, a five-frame nuc might be used, or a ten-frame standard Langstroth. But you should keep in mind that, after the operation is complete, you are likely to have a very heavy object to carry down a ladder or lower with a rope. Sometimes, during the removal of a particularly robust colony, you might even have to replace frames or add a super or even two. If space or configuration doesn't permit this, and the bees cannot all fit into the hive and begin to cluster outside it, I vacuum the excess into a special container and release them in an apiary.

You actually might not be able to remove the hive when the time comes, and that time is probably going to be in the dark of night or in the early morning when everything is cold and wet and slippery. If you remove it during the day, there will be a number of distraught bees left flying around for many days, and this could be unacceptable to the homeowner and neighbors. An option might be to seal the hive with a closure screen during the night, and then return for them during the day, killing off any bees left flying around. This can be a complication if the job is twenty or thirty miles away, but after you've spent six weeks removing the bees *and been paid good money to do so*, the homeowner doesn't want to see even a single bee.

On occasion I have had to remove several loaded frames and put them into an empty super during the day, take down the hive later and replace the frames. One time, the hive was hanging from a beam underneath a roof overhang. It was heavy and secured with ropes, therefore

it could not be opened, nor could it be moved around. I was able to position the ladder (just barely) so that I could get a shoulder under and against it. Then, in the dark and entirely by feel, I screened the entrance, untied it, and hoped for a controlled drop. It turned out to be a semi-controlled and lucky drop of about a foot-and-a-half, coming to rest against the ladder and my shoulder. Then, very slowly, using every bit of strength I possessed to hold it back, I slid the thing down inch by inch.

So positioning the hive is an important matter. Sometimes there will be a roof or other shelf arrangement conveniently in place – but usually you will have to construct something. A temporary platform needs to be strong enough to support the hive and temporary enough to be taken apart without damage to the structure. If that's not possible, the hive can be hung with ropes.

Simultaneous to placing the hive, the bees' entrance is rigged with a one-way contraption. I do not like commercial bee escapes because they are too difficult to monitor and if a few dead bees plug up the mechanism, they are too difficult to clear. I like funnels made of flyscreen, the narrow end just wide enough for a single bee to pass at a time. You may read that the narrow end should be wide enough for two or three bees, but I disagree because it is too easy for them to get back in – and they will do it if they can.

The wide end of the funnel should be large enough to comfortable be fixed over the opening in the structure. This is done usually with thumb tacks. If the opening or the nature of the structure does not permit this, a piece of plywood with a two-inch hole, over which is fixed the screen cone, is attached to the structure, usually with duct tape and/or nails.

All this can be tricky because it must be done at a time when bee activity is at a maximum and where they are most aggressive (at their entrance) and, usually, it is done without gloves. (Ever try positioning thumb tacks and duct tape with gloves on and with one hand – because the other is holding the escape in position or holding the ladder. Yes, bee removers need three hands. It's a requisite.) So you're probably going to get stung. And you'd better be able to remain calm and continue to work. Otherwise, retreat and change strategy. Thumb tacks and the basic pieces of tape can, if necessary, be placed with gloves on. Go down the ladder, take the gloves off, tear the tape into appropriate pieces, stick them somewhere convenient (maybe to the front of your beesuit), replace the gloves, go up the ladder and place the tape, one strip at a time. It's probably going to be a rough job, doing it like this, and you might have to go over it later, when things quiet down.

Eventually the entrance – which is now supposed to be the only "exit" – is in place. And the hive is in place also – meaning that the hive entrance is close to the opening in the structure. Not too close. You wouldn't think so, but it can be too close – complicating access later for manipulations that might become necessary. And not too far away. Eight inches to a foot is about right. Sometimes it might be practical to seal the bottom entrance of the hive and slide back the top so that a three-eighths inch slot is opened and the bees can go into the hive from the top – this slot is adjusted by the inclusion of wooden cleats. This is only until the bees are accustomed to the hive – then the top is closed and the bottom is opened, also adjusted with wooden cleats. The top should not be left open longer than necessary, because the internal heat rises (and escapes).

Now you can observe for a while. The returning field bees will back up at the entrance, crawl around confusedly, take wing again, and fly around until there is a virtual cloud swirling around the area. But probably it has already taken you longer than you expected, and you most likely have other things to do. So, once you see the bees beginning to enter the hive and performing the Nassanoff maneuver around the entrance, you can take it on faith that it is going to happen, and you can leave.

But you will have to come back and check it just about every day – because things are going to require your attention. The most common problem you can count on will be dead bees clogging up the narrow end of the funnel. When this happens the entire process is stopped. You have to remove the obstruction, and tweezers are the best tool for the job. By the way, to prevent clogging, as well as because it is easiest for bees to find their way out of a funnel when they can crawl upward, the funnels work best when pointing up. But conditions do not always favor this position. Most clogging occurs when the funnel points downward.

If the bees figure out a way back into the original dwelling space once everything is in place, you have the second most common problem – a second entrance. They can be exceptionally devious and frustrating, these bees, sending you back again and again. And time is money. It's not only the time it takes you to find their holes and plug them up, but every time they find a way around your intentions, they become more determined to do it again, and more determined to reject the home you have chosen for them. This is not good because the brood may die and rot, and you will need to install another frame. Brood is money too – not to mention the fact that the hive you take it from gets a setback. And then there's all your running around .

If the opening is from the surface of a shake roof, I would be tempted to tell you, as I tell myself, to not take the job. But I always do – crying and moaning all the way – and I assume you will, too. The best advice in this type of situation is to cover broad sections of the roof with large pieces of plastic tarp. The problem here is holding it all in place – no small problem. For one thing, you can't drive nails into shake. Nor can you usually use weights – too dangerous on slanted surfaces. You have to use tape

Continued on Next Page

Make sure your supports are sturdy, because when you're done the box will be heavy.

REMOVING BEES ... Cont. From Pg. 269

(which doesn't adhere well to shake), and a good gust of wind – endemic to roofs – can easily mess everything up. You can hold it all down with criss-crossed tie-downs, but only a small single hole is necessary to set you back. And the bigger the tarp, the easier it is for those small, unobtrusive openings to develop. I have spent hours uncomfortably perched on high, steep-graded roofs taping shake together with hundreds of pieces of tape. And once you do get the bees out, it is practically impossible to keep them out. People with shake roofs should be required to keep their bees.

The third, and most troublesome of the traditional problems is when the bees discover they can re-enter through the small hole in the funnel. Often it is not obvious that they are doing this since the funnel is usually covered and crowded with bees and the bees going in are occasional and single. But when they are doing it and you do not correct the situation, you will never, I repeat, *never* get them out. So here's how to handle it.

First watch the pollen-bearing bees carefully. These will make every effort to go to where the queen is, and it will be easier to see them going into the funnel than the nectar-bearers. (When the pollen-bearers are going enthusiastically into the hive and showing no signs of referring back to the original space – you have won.)

The best bet is to place another, larger funnel directly over the existing one. Secure it in such a fashion that there are openings left around the base. That way, the bees that enter the funnel crawl right back out again and eventually give up and join the progression into the hive. I have not yet encountered any bees able to defeat the combination of two cones. If this should happen, then it is safe to suppose that they will be able to master three. In that case, I would play with the wires of the mesh at the narrow end so that each bee would have to force her (or his) way out, and that no bee would be physically able to get back in. This would be a delicate and meticulous process requiring continual adjustments, so I wouldn't want to do it – but it could be done, and it would be the next step. Unless someone thinks of something I haven't.

When the bees have stopped coming out of the structure, the job is basically over. Give it an extra week or so, just to make sure. Then remove the funnel and permit the bees to rob out the original habitat. Let them have at it for two or three days. Replace the funnel for another two or three days – and then you should be finished.

Be sure to inform the dwelling's owners when you are going to remove the hive. It is surprisingly easy for them to forget about you, and when you show up at night or before dawn and start banging around on their roof their reactions may be unanticipated.

Come back later to clean up, seal up, and collect your money, and you're out of there.

About public relations: Don't leave anything for the homeowner to do – unless it is really clear and agreed upon. One time I performed an extremely difficult removal. The colony was very inaccessible and the homeowner very allergic. The job had to be done. And it had to be done hanging over the edge of a high roof, on my stomach, as far as I could go, bent almost double and beneath an overhang. It was shortly after the great earthquake, so I was very aware while I worked that one good aftershock and it would be over for this beekeeper.

When the job was finished, the homeowner told me to leave it all as it was and that he would caulk the area promptly. Three weeks later, before he got around to it, another gang of bees had worked a piece of duct tape loose and a new swarm moved in and took up residence. So whose fault was it? My work is guaranteed for three months. I did it all over again, even though I believe the fault was his. In fact, I didn't have the heart to charge again. I know, I'm too nice a guy but maybe I can change.

I once experienced some difficulty getting paid. When the job was done, I called the man and set up an appointment to pick up the money. When I got there, the secretary told me she didn't know where he was. So I waited. It was 30 miles from my place. So I waited some more. Everyone was real sorry, but nobody knew where he was. Eventually I went home. It took a few days of calling and leaving messages (which were never returned) before I was finally able to get my man on the line. He apologized and set up another appointment. I believe he was trying to stiff me, hoping that by making it difficult for me to collect, I'd give up and be satisfied with the bees I'd acquired and disappear. I told him, calmly and politely, that if he stood me up again, I had no choice but to give him back his bees. There was no further problem.

Trying to remove a delicately placed, heavy box while holding onto a ladder can be an athletic event unsurpassed even in the Olympics. Plan ahead when placing the capture hive.

Sometimes you get lucky and access is easy and removal a breeze. Don't bet on it. And use very sturdy rope. Make sure you come back and clean up all the equipment you left, and be sure you notify the homeowner of your arrival.

THE HONEY BEES OF SANTA CRUZ

Our familiar honey bee, not native to the United States, has been intentionally transported on a larger scale than might be true for any other animal or plant species (ably reviewed in 1989 by Walter Sheppard). During the colonial period, the dark European bee ("German" bee), *Apis mellifera mellifera*, was the primary bee of commerce (1500-1850). In fact, in Sheppard's words, "Prior to the introduction of the Italian race..., *A. m. mellifera* was the sole race of honey bees present in the United States."

The Virginia Colony was the first to import honey bees (in 1622); by 1654 honey bees had been established in New England. The frequent swarming habit of dark European bees, favored by beekeepers before moveable frame hives were available, resulted in their rapid spread throughout the eastern United States during the next 200 years.

Up to a century and a half ago, overland shipment of bees to California was considered impossible – travel through the Great Basin and deserts of the Southwest was too arduous. A botanist, Christopher A. Shelton, first breached that geographical barrier by bringing bees in by ship. An unknown beekeeper had transported 12 colonies down to Panama in early 1853 and sold them to Shelton, who at that time was introducing various plant species to California. Shelton managed to get the colonies to th Robert F. Stockton Ranch, just north of San Jose, California, but only one colony survived.

Other shipments followed, imported by John Harbison during the mid-1850s. Harbison had abandoned gold mining to start the first nursery of fruit and ornamental trees in the Sacramento Valley but soon turned to beekeeping on a large scale. Known as the "Bee King of California," he invented the comb honey section box still in use today and published *The Beekeeper's Directory*. Soon honey bees were dispersed throughout California – before 1860 a thousand colonies were already present in San Jose.

In 1856 Southern California got its first bees from some of those original importations, and Ventura County – nearest point to the Northern Channel Islands off Santa Barbara – had its first commercial apiary in 1873. About that time an unknown beekeeper brought bees out to Santa Cruz Island but abandoned them well before 1880. Bees from that original introduction multiplied and spread over the entire island, with apparently no introductions since that time. The adjacent Northern Channel Islands had no such importations and have never had honey bees, but Santa Catalina Island in the southern group does have bees.

While dark European bees were being introduced into California, another development began in 1851, one that changed both beekeeping and the bee of commerce. Lorenzo Langstroth determined dimensions of the correct "bee space" and invented the first practical moveable frame hive. Beekeepers began replacing dark European bees, noted for their excessive use of propolis and rather poor hivekeeping behavior, with Italian bees. In Ohio, Langstroth obtained his earliest shipment of Italian bees from Germany in 1863, but the first successful direct shipment of Italian bees had been into New York three years earlier.

Completion of the Transcontinental Railroad in 1869 permitted rapid transportation of bees from the East to the West with the first Italian colonies on record reaching Los Angeles, California in 1875. As in the East, California beekeepers gradually replaced dark European bees.

There are two sides to this coin, however. Whereas we can laud diligent beekeepers for their transportation of colonies nearly everywhere in the world, the degree to which those bees have affected various native bee species remains a question. During our visits to Santa Cruz Island and Santa Rosa Island (six miles to the west and an island on which European bees have never existed), we noticed remarkable differences in insect visitation on flowering plants.

Nearly all insects visiting the more prominent Santa Cruz Island plants were honey bees, but a wide spectrum of bees, wasps, flies, and moths visited the same types of flowers on Santa Rosa Island.

Several years ago all five of the Northern Channel Islands were designated a U.S. National Park. Santa Barbara Island, Anacapa Island, and San Miguel Island were already administered by the Park Service at that time. Subsequently, Santa Rosa Island was purchased and placed under their control. Most of Santa Cruz Island remains an inholding of the National Park under ownership by The Nature Conservancy, with the Park Service continuing negotiations to obtain the remainder of the eastern tip of that island.

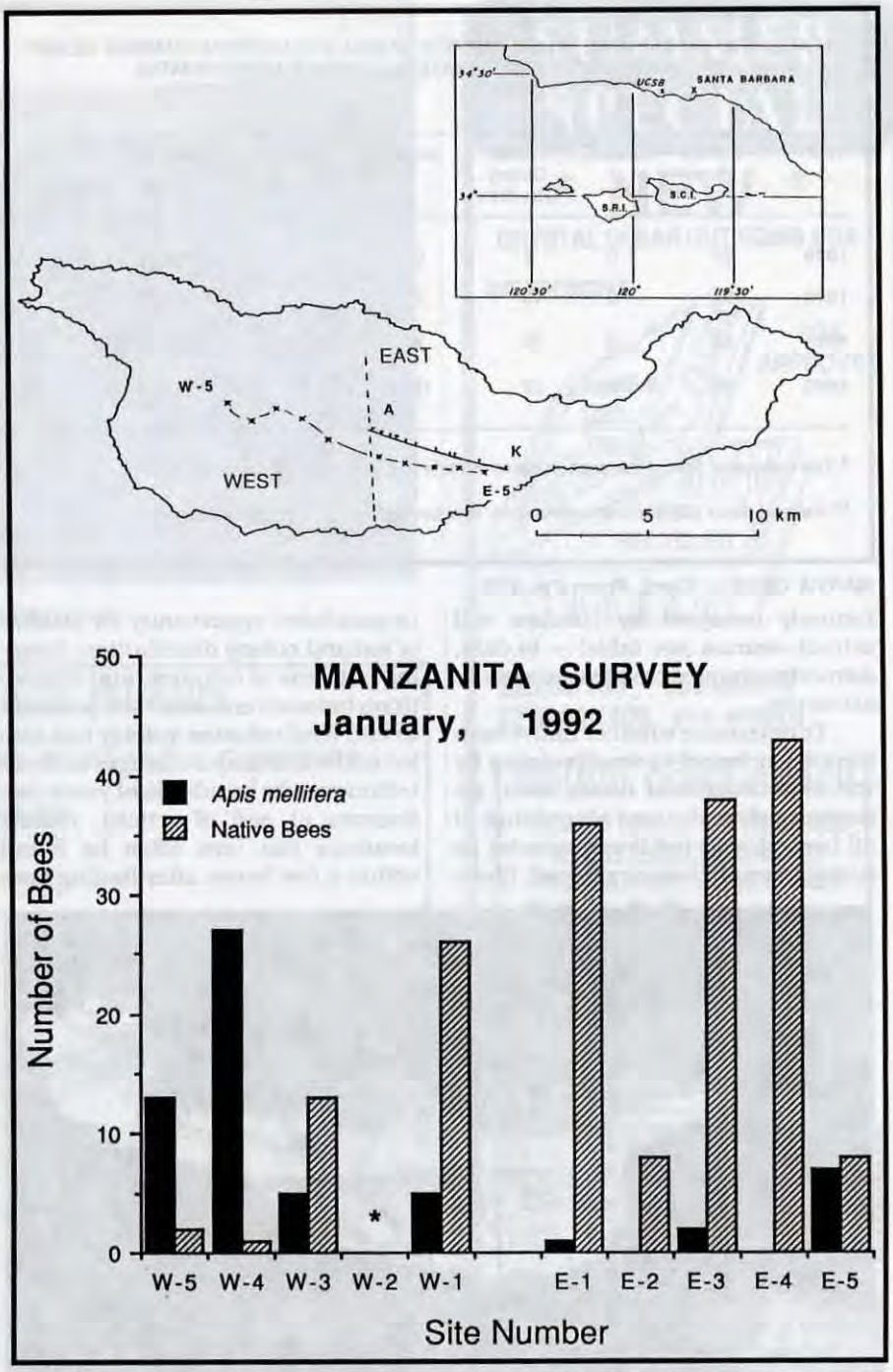
An opportunity arose. Since Santa Cruz Island is the only one of the five islands that has ever had honey bees, is essentially uninhabited, and has well defined limits, we reasoned that it should be possible to locate and remove all honey bee colonies. Such an effort would provide us with at least one National Park where native bees would prevail and where a pre-European ecosystem could be studied, once native insects on that island had again achieved somewhat of a balance. Furthermore, with the apparently inevitable influx of Africanized bees into our local area, we could have a Southern California habitat free of that hostile intruder.

Accordingly, five years ago Robbin Thorp of the University of California, Davis, campus started a study of plant visitation to determine diversity and abundance of native bees and potential competition for pollen and nectar with honey bees while Adrian Wenner of the UC, Santa Barbara, campus searched for feral honey bee colonies. After two years of study, elimination of colonies from only the eastern half of the island began. This two-stage removal process would then permit studies of flower visitation and pollination on the eastern vs western halves of the island — as well as permit similar studies between Santa Cruz Island and honey bee-free Santa Rosa Island. Fortunately, our area has a Mediterranean climate, active foraging occurs all year, and studies can be conducted year-round.

Work on the project has been proceeding much on schedule, with the eastern half of the island largely free of feral bee colonies. More than 160 colonies have been located (see table), of which about 130 have been removed. Laying queens have been recovered and provided to bee researchers and beekeepers so they can learn more about the characteristics of these bees after 110 years of isolation. Inspection of colony structure and behavior indicates that the island feral bees appear to be very similar to the dark European strain (except for color) and remarkably uniform over the entire island.

Records are also being kept of both colony location and cavity type (see table). About two-thirds of the colonies found have been in cliff faces, either in discrete cavities, within rocky crevices, or under rock shelves. Other common sites are eroded cavities under the boles of scrub oak trees. Rarely are colonies found in the classic "bee tree" cavity, even though many such trees exist all over the island.

Dozens of the Schmidt-Thoenes bait hives have been installed at various points around the island. Catch frequencies by those hives permit a comparison with how well cavities



Continued on Next Page

YEARLY SWARM CAPTURE ON SANTA CRUZ ISLAND, A CALIFORNIA CHANNEL ISLAND WITH MEDITERRANEAN CLIMATE (ALL VALUES APPROXIMATE)

Year	Survey Hives	Swarms	Former Colony Cavities	Swarms	Swarms in New Cavities	Weather
1989	30	0	2	0	1	Drought
1990	54	0	13	0	0	Drought
1991	60	5	76	2	?	Wet March *
1992	68	9	92	15	4 **	Average

* The one major rain of the season came too late that year to produce buildup.

** Several times this number ended up in new cavities and are yet to be found.

SANTA CRUZ ... Cont. From Pg. 273

formerly occupied by colonies will attract swarms (see table) – to date, formerly occupied cavities seem more attractive.

To determine whether native bees have been forced to small refuges by the more dominant honey bees, we measure diversity and abundance of all bees at selected flower species as honey bees are being removed. Since honey bee removal began, the numerous species of native bees have been increasing in numbers rapidly and now outnumber honey bees at blossoms on much of the eastern half of the island (see figure).

The isolation and minimal human habitation of the 96-square-mile island since honey bees were introduced 110 years ago also permits an unparalleled opportunity for studies of natural colony distribution, foraging patterns of colonies, and competition between colonies. The pressure to find feral colonies quickly has also led to the first major changes in those techniques in hundreds of years (see Sources at end of article). Colony locations can now often be found within a few hours after finding bees at blossoms or at water – the record (held by Dan Meade of UCSB) is 24 minutes.

A satellite radar picture of Santa Cruz Island, illustrating the rough topography. Santa Rosa Island (6 miles away) is at the lower left.

Other bee researchers have become involved in the project to varying degrees. From the Tucson USDA bee research laboratory, Justin Schmidt and Steve Thoenes have furnished bait hives and pheromone lures for our use, while Gerry Loper has studied drone aggregation sites. Steve Buchmann from that laboratory has started an analysis of pollen grains to determine how far bees might range while foraging. Howell Daly from the UC Berkeley campus is conducting a measurement of wing patterns to determine which strain the Santa Cruz Island bees might belong to, while Rob Page of the UC Davis campus is conducting allozyme and DNA analyses toward that same end.

Dr. Wenner recently retired as Professor of Natural History at the University of CA, Santa Barbara but continues his honey bee research on Santa Cruz Island. Dr. Thorp is Professor of Entomology and Apiculturist at the University of CA, Davis.

The information for this article was obtained from several sources, most of which are listed here.

Caron, D.M. *The Harbison California hive has a place in our beekeeping heritage.* American Bee Journal 128: 29-31. 1988.

Crane, E. *The Archeology of Beekeeping.* Cornell Univ. Press, Ithaca, NY. 1983.

Harbison, F.R. *Flood Tides along the Allegheny.* Massy Harbison Chapter, DAR (reprint), New Kensington, PA. 1941.

Mason, J.D. *History of Santa Barbara and Ventura Counties, California.* Howell North Books, Berkeley. 1883.

Root, A.I., E.R. Root, H.H. Root, and M.J. Deyell. *The ABC and XYZ of Bee Culture.* The A.I. Root Co., Medina, Ohio. 1947.

Ruttner, F., E. Milner, and J.E. Dews. *The Dark European Honey Bee:* Apis mellifera mellifera *Linnaeus 1758.* The British Isles Bee Breeders Association. 1989.

Schmidt, J.O. *Swarms traps: An example of research and technology transfer.* American Bee Journal 130: 333-334.

Schmidt, J.O. and S.C. Thoenes. *The efficiency of swarm traps: What percent of swarms are captured and at what distance from the hive?* American Bee Journal 130: 811-812. 1985.

Sheppard, W.S. *A history of the introduction of honey bee races into the United States.* American Bee Journal 129: 617-619; 664-667. 1989.

Watkins, L.H. *California's first honey bees.* Amer. Bee Journal 108: 190-191. 1968.

Watkins, L.H. *First honey bees in New England - 1638?* American Bee Journal 108: 19. 1968.

Watkins, L.H. *On the transportation of honey bees to California, 1853-1861.* American Bee Journal 109: 468-470.

Wenner, A.M., D.E. Meade, and L.J. Friesen. *Recruitment, search behavior, and flight ranges of honey bees.* American Zoologist 31: 768-782. 1991.

Wenner, A.M., J.E. Alcock, and D.E. Meade. *Efficient hunting of feral colonies.* Bee Science 2: 64-70. 1992.

A view from the top of Devil's Peak in the northern range, towards the south-southwest.

SANTA CRUZ ISLAND

COLONY, CAVITY, AND MORTALITY SUMMARY

10/92

A — COLONIES FOUND

Year Found	East Half	West Half	Total
1988	14	13	27
1989	21	14	35
1990	20	8	28
1991	33	4	37
1992	32	5	37
Total	120	44	164

B — CAVITIES (Not Complete)

Cliff Hole	26	11	37
Rock Crevice	30	7	37
Rock Overhang	12	7	19
Clay Bank	5	3	8
Tree Trunk	23	11	34
Tree Bole	19	5	24
Total	115	44	159

C — MORTALITY

Natural	12	7	19
Other Dead	86	3	89
Likely Dead	26	0	26
Total	124	10	134

UNITING COLONIES

From An English Perspective

This U.K. Hobbyist Reviews All The Ways & Means Of This Management Scheme.

karl showler

Beekeepers have a tendency to unite small colonies, nuclei or swarms. They believe that the united colony has a better chance of surviving bad or winter weather than its component parts, or, energized, make a better foraging colony for the summer.

There is some risk in bringing together small colonies because their reduced size may be due to disease or from some inherent weakness. Before uniting be certain that the colonies involved are healthy and worth saving. Combining may mask conditions that can be carried over to another season; for the long term good of the apiary the destruction of the small lots might be the better course to take.

Uniting bee colonies is an unnatural process rarely found in the wild although the merging of swarms or the take over by swarms of weak colonies is reported in the bee press.

In much of the U.S. bees thrive well so there is little cause to unite colonies although books on practical beekeeping often mention it as an aside rather than exploring its range of techniques. E.R. Root in the first (1877) edition of The *ABC of Bee Culture* devoted the two pages of "U" to the topic. It is clear from early editions of both Langstroth and Quinby that they were put off by this manipulation by a fear of robbing and intercolony fighting.

E.F. Philips in *Beekeeping* (1915) touched on the subject in eight lines, the 1960 revision of *Beekeeping* by Ekert and Shaw included uniting under swarm control where they reduced the size of swarming colonies by removing young bees, uniting them with other colonies. A short mention is made in Morse and Hooper's *The Illustrated Encyclopedia of Beekeeping* (1985). However, the Johanssons present a comprehensive listing of techniques in *Some Important Operations In Bee Management.*

Although published in 1932 Wedmore's *A Manual Of Beekeeping* is still the clearest, most detailed guide available. Succinct descriptions will be found in both of Harry Riches' books, *Beekeeping* and *A Handbook Of Beekeeping,* and in Ted Hooper's *Guide To Bees And Honey.*

Advantages

Colonies can be united to

a) bring together small colonies and nuclei at the end of the season when they might not survive winter,

b) give a large foraging force in a single colony before the flow, fewer bees then being needed to care for the combined brood nest,

c) bring together used queen rearing units that are no longer required,

d) save the foraging force of a queenless colony or one with laying workers by joining it to a queenright one,

e) provide a home for swarms "in season" when they can be united to give a strong foraging force, and,

f) house several unwanted swarms after the mid-year flow so they may build up on later nectar sources to become a viable unit for the following year.

Planning and Preparation

Consideration should be given to alternative methods in case the favored technique runs into trouble. Many beekeepers make things difficult for themselves by not thinking out or working through a "dummy run" of the proposed method.

Bringing together bees may set up fighting between them as well as drawing in bees from other hives in the area.

The merging of colonies is more safely undertaken

a) during a nectar flow,

b) by prior feeding of the colonies to be united,

c) by giving the bees a common artificial scent,

d) by placing one colony over another so the bees acquire a common odor before merger,

e) by a weak sugar spray over the bees providing time is allowed for them to ingest the syrup (if robbing by other colonies is feared a plain water mist can be used), and,

f) by exposing the bees on their combs to light.

Summary of Basic Methods

To overcome one colony's antipathy to another the beekeeper needs to put the combining units into a situation where

1) they are not stressed by lack of incoming nectar i.e., by advance feeding,

2) their natural defense mechanisms are overcome by gradual merger, i.e., through a punctured paper that lets the bees acquire a shared colony odor as they gnaw through the paper. In the past newspaper was suggested as the temporary separating medium but some papers use a dirty, soft ink that can easily spread through the colony, or be transfered to honey stores. Plain food-quality lightweight wrapping paper, not greaseproof, is a suitable alternative.

Union may be accomplished through two travelling screens, one above the other, or a double screen, that allows the bees to acquire a common odor and food share but does not allow "fighting" contact. The upper lot have their own entrance until the screens are removed.

3) by spraying with a mild scent or using a lot of not very pungent

smoke,

4) by joint manipulation of two adjoining hives during which their combs are intermingled,

5) by confusing the bees with dust, flour or water-mist so that grooming, cleaning and feeding takes priority over fighting.

In traditional beekeeping with skeps, although it was not possible to unite colonies "on the comb", bees were driven from their skeps into a union. The method adopted was to invert the skep to be driven, securing over it another empty one to receive the bees as they were "drummed" up and out of the lower skep. Both lots of bees to be merged were gently shaken into one skep, at the same time being dusted with flour or dust to mask their differing scents. The beekeeper then had the option of returning the united bees to one set of combs or of keeping the bees as a swarm.

The same dusting technique can be applied to swarms originating in an apiary as bees with a common genetic background are less prone to fight each other.

Uniting Methods

It is assumed that the units being united are brood boxes; any supers they may have are either given to other colonies or returned to the united colony. Clearly, supers filled with bees cannot be replaced without brushing off the occupying bees or uniting them by the paper method.

Paper Method Useful for strong colonies or in poor weather conditions when it would not be advisable to open hives. The two hives are brought together on separate stands side by side. When they have settled down, say after two days, one may be made queenless unless it is already so.

The following quotation from Wedmore's *A Manual Of Beekeeping* gives clear guidance as to the positioning of the boxes: "In selecting which colony to put on top, however the lower one would remain on its own stand even if this involves two movements instead of one. Rules

(a) When uniting a weaker to a stronger stock, put the weaker stock on top.

(b) When uniting a queenless lot to a normal stock, put the normal stock on top and use an entrance guard.

(c) When uniting two lots much alike, put the moved stock on top."

If it is not practical to find the queens, then they are left alone, as the populations of the two brood boxes unite the bees will select one queen or they will permit both to work until one is superceded.

A sheet of paper placed between the two to be joined slows the mixing of bees, but permits the blending of colony aromas, facilitating unification.

Hunting for the queens in advance does upset the colonies and puts a lot of flying bees into the air making union more difficult.

Direct Union Two lots of equal size can be united by placing the hives as close together as possible so the foragers intermingle in flight before the hives, and freely enter either colony without difficulty. After two or three days the colonies can be manipulated, removing unwanted combs from both and then putting alternate combs from each colony into one broodbox.

Union by Anesthetization Although this is mentioned by Johansson in *Some Important Operations In Bee Management* it is clear few authors have direct experience with it. The fumes of smoldering puffball (*Lycoperdon giganteum*) are reported by Howes to put bees to sleep for a few minutes without harmful effect. Presumably two colonies could be treated at once then the sleeping bees mingled together until they awake as a united colony. Finding both queens and removing one would help in the uniting process. This however, is seldom recommended, and is not so here.

Uniting a Queenright Nucleus to a Queenless Colony Either by the paper method, although it might be a safeguard to equalize the number of combs by removing in advance from the lower box two or more unoccupied outside combs, adding these to the upper box combs, or, by direct introduction if the main colony is not too large and has been queenless for 24 hours.

Uniting Two or More Nuclei or Small Colonies The paper method is one option, direct union is another with combs being taken in order and in turn from each box to be placed in the new one. If the uniting units are opened up so that the frames are well spaced in their respective boxes the bees will be very much disorganized and union facilitated. Ideally the poorest queens should be removed but this may not be possible; however the united bees will select a queen in a day or two.

Uniting Swarms to Colonies Johansson explains this is not an easy operation if the swarm is being added to a strong colony. There is always the chance that the swarm may fly off during the manipulation,

Continued on Next Page

UNITING ... Cont. From Pg. 277

taking many of the colony bees with it.

Method (i). The swarm's queen is located and removed. It is never advisable to kill a queen immediately; she may be needed later in the day. The queenless swarm is then united with the recipient colony by the paper method.

Method (ii). If the swarm queen cannot be found, hive the swarm on foundation, allow it to draw a little comb to get its queen into lay to be certain it has one. Then unite it by the paper method.

Method (iii). With several swarms, hive the first swarm on one drawn comb with two frames of foundation, treat likewise the next two swarms so we have three swarms on three combs each in three hives; when all the queens are settled, unite by the direct method, disposing of two queens.

Method (iv). This is a less elegant method for use with several swarms. Hive the first swarm on two drawn combs, preferably combs of young brood from another colony and eight frames of foundation. The combs of foundation are important as they give clustering space. Allow 24 hours for the bees to settle. After adding an empty brood chamber or two empty shallow supers over the hived swarm, tip each additional swarm over the frames. Smoke gently to get all the bees down between the frames and to aid union. Remove the empty boxes and add a cover, close the hive down and leave for three days. It is to be expected one queen will survive and be in lay fairly quickly. If the surviving queen is unmated there may be a delay of up to three weeks.

Uniting a queenless or, laying worker colony to a queenright colony Use the paper method, with the queenless or laying worker lot over the queenright colony. Alternatively the laying worker colony is stood near a queen right one for a few days then its combs are taken one by one to a far corner of the apiary and all the bees shaken out. The brood, such as it is, is then given to other colonies. The homeless bees will fly back to the site occupied by the queenright colony whose guards will dispose of the laying workers and accept the others. This is a tedious process, but usually effective.

Adding foragers to another colony Called by some the "Aalst Method" after the district in the Netherlands where it is used. A nucleus is made up from two or three colonies and located some 12 feet to the side of, but in line with, one "parent" colony. Once the nuc is established and its queen laying well, it is moved day by day nearer to its parent until they are in close contact at entrance level. The nuc is then moved some 12 feet on the other side of the parent. The nuc's foragers return to the old site adjoining the parent, having no other home, they enter and strengthen it. The moves side to side of the parent are repeated, the nuc by shedding its foraging force keeps small and gives the parent a regular supply of foragers. This, too, is tedious, but is an interesting process to watch.

No matter which method you choose, some will always and some will never work for you. The fun is in the trying. ○

References

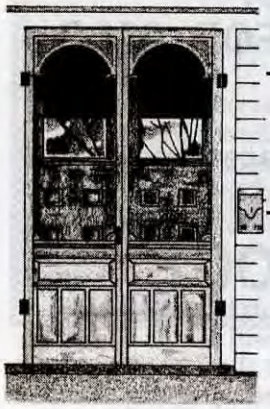
Howes, F.N. *Plants and Beekeeping* 1945 reprinted 1979 page 186

Hooper, W.E.J. *Guide to Bees and Honey* 1976 reprinted 1991 mainly pages 140-141, 162-3

Johansson, T.S.K. & M.P. *Some Important Operations In Bee Management* 1978, p. 13-17

Riches, H.R.C. *Bee Keeping* 1976 page 49; *A Handbook of Beekeeping* 1992 pages 54, 73, 74, 160.

Wedmore, E.B. *A Manual of Beekeeping* 1932 reprinted several times, headings of numbered paragraphs – driven bees to established 1587; flying bees to established stock 1590-5; in general 1088, 1577-9; light, use of 1581; newspaper (paper) method 1582-4; scent, use of 1580; super clearer, use of 1585; swarms 1586; young bees to stock 1588-9.



HOME HARMONY

ann harman

From Soup To Nuts

"Everything from soup to nuts!" This favorite saying applies not only to cooking and meals but to just about everything else. I can't find a source for the saying, but if you think about it you will realize that honey can be used for everything from soup to nuts. The following recipes were not selected as a meal menu, but rather for use at different times and different meals. Let's start with soup, of course.

Spinach Soup

This refreshing soup recipe is so quickly made that you will appreciate it many times during the summer weather to come.

1 cup water
1/2 cup chicken stock
10 ounces fresh leaf spinach
16 ounces plain yogurt
1/2 cup wheat germ
2 tablespoons honey
1 tablespoon chopped chives
1/2 teaspoon celery salt

Place the water, chicken stock and spinach in a blender and blend at low speed until smooth. Add the remaining ingredients and blend thoroughly at high speed. Pour into a serving dish or individual soup bowls and refrigerate for 1 hour before serving.

The Book Of Honey
by Claude Francis & Fernande Gontier

Far Eastern Chicken

After the soup course, comes the meat. Everyone is always looking for a different sort of recipe for chicken. This one is a delightful blend of spices and is quick and easy to fix.

6 whole chicken breasts, skins removed
1/2 cup honey
1 tablespoon cinnamon
1/2 teaspoon curry powder
1 teaspoon salt (optional when using honey)
1 clove garlic, minced
3/4 cup unsweetened grapefruit juice
1 cup crushed pineapple

Place chicken breasts in a single layer in a large frying pan. Combine the honey, cinnamon, curry powder, salt and garlic in a large measuring cup. Stir in the grapefruit juice, blending well. Pour over the chicken. Cover the pan and simmer over medium heat for 20 minutes, stirring to prevent sticking and turning the chicken once. Preheat broiler. When the chicken is tender, transfer to a broiler-proof serving dish. Combine the pan juices with pineapple and spread this mixture evenly over the chicken pieces. Broil six inches from the heat for 5 minutes, or until lightly glazed and bubbling. Serve with steamed rice.

Honey Feast
Gene Opton & Nancie Hughes

Honey Vegetable Piquant

Now for a vegetable. This recipe is appropriate since it is a medley of several vegetables.

2 cups sliced carrots
2 cups sliced celery
1 cup water
6 small green onions, cut in 1-inch pieces
1 package (10-ounces) frozen peas
1 teaspoon salt (optional when using honey)
1/4 cup honey
1/4 cup vinegar
2 tablespoon soy sauce
2 tablespoons cornstarch
1/2 teaspoon ground ginger
1/4 cup cold water

Cook carrots and celery in 1 cup water until crisp-tender, about 10 minutes. Add green onions, peas and salt. Cook about 2 minutes. Combine honey, vinegar and soy sauce and stir into vegetables. Bring to a boil. Mix the cornstarch and ginger into the 1/4 cup cold water. Gradually add to vegetable mixture, stirring constantly. Add a little salt if needed. Cook a few minutes until sauce is clear and thickened. Serve at once.

The Healthy Taste of Honey
Larry J.M. Lonik

Hot Potato Salad

Although everyone has their own favorite recipe for potato salad, sometimes it is worth trying a variation. This potato salad contains everything from soup to nuts and is absolutely delicious. Give it a try – and then take it to the next potluck supper or picnic.

6 slices hickory smoked bacon
1/2 cup onion, minced
1/4 cup wine vinegar
3 tablespoons honey
1-1/2 teaspoon salt
1/8 teaspoon oregano
1/4 teaspoon black pepper
1 tablespoon prepared mustard
3 cups potatoes, cooked and diced
2 eggs, hard-cooked and diced
1/2 cup celery, diced
1/2 cup grated cheese
4 tablespoons mayonnaise or salad dressing
2 tablespoons green pepper, minced
2 medium kosher dill pickles, diced

Fry bacon until brown, then dice. Combine onion, vinegar, honey, salt, oregano, pepper and mustard in a saucepan. Bring to a boil and boil for 2 minutes. Pour hot mixture over potatoes. Stir in remaining ingredients. Serves 6-8.

adapted from VABC
Stores Division

Peach Honey Float

Now for something to drink. If the peaches are bland, use a flavorful honey.

2 cups crushed fresh peaches
1/2 cup honey
1 quart milk
1/2 teaspoon almond extract
1 quart vanilla or cherry-vanilla ice cream

Combine fresh peaches and honey. Add half of milk. Blend in blender until smooth. Then add balance of milk, almond extract and half of ice cream. Blend. Pour into tall glasses. Top with balance of ice cream. Makes 6 servings.

Cooking With Honey
Hazel Berto

Whole Wheat Braids

Bread is an essential part of many meals and therefore should be included in our collection from soup to nuts.

1/3 cup plus 1 tablespoon honey
1/2 cup warm water
1-1/2 packages dry yeast
6 cups whole wheat flour
1 teaspoon salt
1 egg, beaten
1/3 cup powdered milk
1/3 cup oil

Combine 1 tablespoon honey, warm water and yeast. Set aside. Combine 1 cup wheat flour with 1-1/2 cups water in saucepan. Cook until thick and smooth, stirring constantly. Place in large bowl. Add 1/3 cup honey, salt, egg, milk, oil and 1 cup wheat flour. Stir in yeast mixture. Gradually add approximately 4 cups wheat flour to make a soft dough; mix well. Place in a greased bowl, turning dough to grease top. Cover. Let rise in a warm place for 1 hour. Punch down; knead for 3 minutes. Cover; let rest for 15 minutes. Knead a few strokes; divide into 6 equal pieces. Braid into loaves. Bake at 375° for 30 to 35 minutes or until golden brown.

Nature's Golden Treasure Honey Cookbook
Joe M. Parkhill

Honey Delights

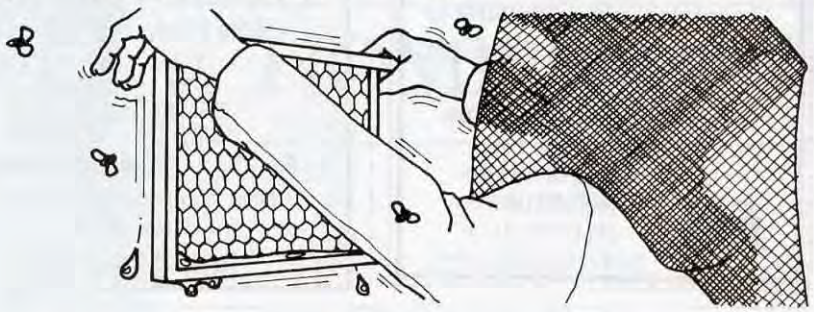
And now for the nuts –

1 cup honey
1/2 cup butter or margarine
1 cup cashews
1-1/2 cup pecans
1-3/4 cup coconut (well, at least it has "nut" in its name)

Cook butter and honey for 10 minutes, or to hard-boil stage. Pour over cashews that have been slightly chopped. Cool until able to handle and roll into small balls. Roll balls in coconut and top each with pecans for decoration.

There – that seems to be everything but the kitchen sink!

N·E·C·T·A·R



RACE RELATIONS

tom sanford

There is a great deal of published information describing differences among the tens of honey bee races now found throughout the world. Italian bees (*Apis mellifera ligustica*) produce large amounts of brood year around, are very quiet on the combs and are somewhat more resistant to American foulbrood than others. Carniolans (*Apis mellifera carnica*), the gray bees of Yugoslavia, rapidly adjust their brood rearing to the season and have a medium-length tongue. The short-tongued German or dark bee (*Apis mellifera mellifera*) is often defensive and susceptible to disease, while the Caucasian (*Apis mellifera caucasica*), with the longest tongue, is prone to foulbrood infection and collects a great deal more propolis than the other races.

Throughout the history of beekeeping in the U.S., the four major European races of introduced bees mentioned above have, like the human population, lost their individual identity and disappeared into a great melting pot. A good deal of advice has been written about maximizing honey production, controlling swarming, and other management practices over the years. In the cacophony, however, the predominant race of bee being kept is often ignored. That's understandable because it's difficult to catalog the insects that inhabit a particular colony.

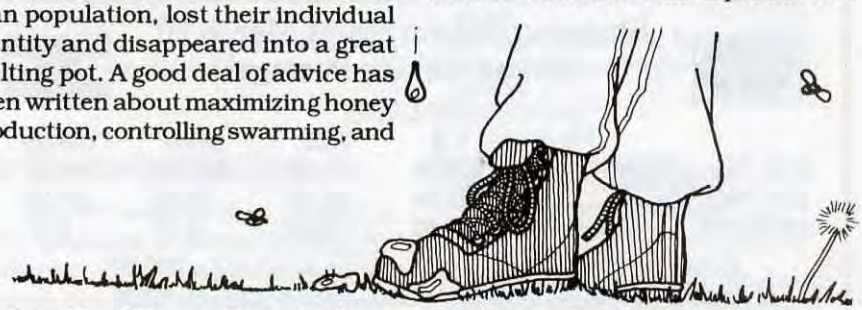
Consider, for example, that any one hive can be a mixture of several races, sometimes called subfamilies. A single queen mated with a number of genetically different drones will produce discrete populations of closely related, but not identical, sisters. These half and quarter sisters relate to each other in subtly different ways that ultimately affect the whole colony's behavior.

Unfortunately, current technology does not allow one to determine the exact genetic composition of a bee colony. Giving counsel or making management decisions, yet discounting the fact that all bees are not alike, however, can be counterproductive. It is not necessarily the ability to react to the status of individual hives, but rather managing the variability among colonies that better defines the true bee master.

A historical concern of the beekeeping industry is the purposeful introduction of bee stock from other parts of the world. This practice is common in both plant and animal breeding programs because it provides what geneticists call "hybrid vigor" Advantages of hybrid vigor in honey bees include resistance to diseases, increased brood and honey production, and more efficient pollen collection.

Ever since honey bees were first brought to the Americas, there has been legal and illegal importation from practically every part of the Old World. The 1922 bee law prohibited importation of bee genetic material; however, many of the world's honey bee genes were probably already present in U.S. population, although often in small, not readily recognized quantities.

The danger from uncontrolled stock importation is possible introduction of exotic honey bee pests and/or behavior of colonies that is difficult to manage. Both of these have been dramatically shown with introduction of tracheal and varroa bee mites, as well as the African honey bee into the Americas.



ON·MY·BOOTS

BEE SPILL EMERGENCY

shawn r kime

The pollinating season was coming to an abrupt end. On the weekends I had helped my father and uncle move more than a hundred hives into the orchards. But now the flowers were rapidly falling from the trees and the hives had to be moved out quickly so the farmers could spray their trees. Time was running out so my father was forced to move them during the week while I was in school. Long before sunrise, my father set out with Mike and my cousin, Scott. The orchards were about an hour's drive from our home. Because they didn't want to make two trips, they had to double stack the hives on their pick-up trucks. The six hives on the top layer were tied together with a rope because the total weight of all of the hives combined keeps them from sliding. This would later prove to be their undoing.

All the hives had been loaded before daylight and not a bee was left in the orchards. The sun was bright and the air warm. As the trucks traveled home over a long stretch of road which was under construction, the six hives on the top story gradually inched over to the edge of the bottom layer. As my cousin, Scott, turned onto the four-lane highway going through Geneva, New York, one of the top hives was carried to the edge of the bottom hives by momentum. The rope pulled the rest along with it. Five of the hives hit the pavement and split open, sending thousands of angry bees into 8:00 a.m. rush hour traffic. The bees immediately began stinging passing motorists and anything that moved.

Scott quickly jumped out of his truck to contain as many bees as possible, but neglected to put his veil and gloves on. He was attacked and had to flee, but he could not get away from all the loose bees. Fortunately, a refrigerated freezer truck was at a nearby store and the driver motioned Scott to run over and get in. Scott jumped in the back and the driver locked him in the zero degree trailer. The driver's quick thinking may have saved Scott's life. The stinging bees were building up on Scott's face and arms faster than he could brush them off. Police officers, firefighters, motorists, ambulance drivers, reporters and shoppers were all being chased and stung. Three television crews showed up and they all got stung!

Five hives hit the pavement, split open and thousands of bees met rush hour traffic.

Meanwhile, my father and Mike began cleaning up what they could. They put hives back together and sat them off at the nearest bee yard, which was about a mile away. Then they brought an empty hive back to the scene, hoping the remaining bees would swarm into it. Still, so many bees escaped that the New York State Department of Transportation and the city police had to close down the highway. All the businesses on the mile stretch of road were closed for the day. Anyone who was outside rushed to the closest store to get away from the bees.

Despite these efforts, many people were admitted to a near-by hospital for treatment, along with Scott who had over 100 sting removed from his head alone. Amazingly, he was able to work several hours cleaning up the broken hives before finally going to the emergency room. His eyes had swollen nearly shut and his tongue was so big he could barely talk! Finally, when there was nothing more to be done at the accident scene, they took the rest of the hives to other bee yards and went home to wait for nightfall, hoping the bees that had been terrorizing that one mile stretch of town all day would go back to the bait hive, left for that purpose.

About dark we went back to pick up the bait hive. It was packed full of the maddest bees I've ever seen. One of the three television stations that had been covering the event all day still had a reporter there. As we were screening the hive to put it into our truck, the cameraman was stung and retreated to his van along with the reporter, leaving their expensive camera in the middle of the highway. I was stung while unloading the hive at the bee yard. As we left the scene, the Department of Transportation reopened the highway and the mishap was apparently over.

It was not. In addition to watching the coverage of the spill on the television and reading about it on the

Continued on Next Page

It's not over 'till it's over. We watched it on T.V., saw it in the headlines and waited . . .

BEE SPILL ... Cont. From Pg. 283

front pages of newspapers, there was the fear of being sued for someone's injuries. If anyone who had been stung was allergic to honey bees, they could have died. For any size beekeeping operation a lawsuit of this magnitude would be devastating. We could have been forced out of business and quite possibly lost all of our other assets.

The truly scary thing is that this could have happened to any beekeeper who pollinates or transports a hive or swarm. We had been moving bees for twenty accident-free years when this happened. One hive can be as bad as twenty when it comes to someone being hurt. One way to protect yourself is to check your insurance. Ordinary car or truck insurance won't cover medical expenses and lawsuits of bystanders being stung. Talk to your insurance agent about what kind of liability insurance policy you need before you move a single hive this spring. Most importantly, try to prevent the accident before it happens. Tie the hives down securely from several angles. Build racks to make sure hives can't fall off. If possible, try not to stack the hives. Avoid rough roads and areas under construction. Above all, drive slowly and carefully.

In addition to taking precautions, know what to do if an accident does happen. Don't get out of your truck without being fully dressed in your bee suit. The best thing you can do is tell the local police department what has happened. They can get the needed help and most importantly, keep people away from the area. The best way to control spilled bees is to mix soap or other 'soapy solution'* into the water tank of a fire truck and spray the broken hives and whole area. Soap is the best way to kill honey bees and the use of a fire hose makes a quick job of it. Refer to the July 1992 issue of *Bee Culture* for more details on cleaning up bee spills.

Keep this tragedy in mind before embarking on another pollinating season. Be sure you have an insurance policy that will cover this type of accident, be careful moving bees. Know what to do if an accident occurs. Remember, even one hive can fall from a truck and have catastrophic results. Heed the warnings of experienced bee spillers, and have a safe pollinating season. Hopefully, if you have kids, they won't have to come home from school to hear their mother say, "Honey, dad spilled the bees." ○

Editor's Note: *Most fire departments routinely use a 'foam' solution for fire control (Triple F, etc.). These solutions are 'soapy' and control bees very well. Agricultural surfactants (wetting solutions or agents) also work well. The key is to use at least a 3% solution. A cautionary note: killing honey bees with any soapy water solution, even in a public health emergency *may* be against the law in your state. The question whether to kill bees or save lives is easy to make, but be aware of the conflicts that may arise. Additionally, this situation reinforces the habit of carrying a sting kit in your vehicle AT ALL TIMES.

CHOOSING AN APIARY SITE

Would *You* Want To Live Here?

steve taber

There are three factors to consider before you decide to put bees at a certain location. These are 1) other people, 2) your convenience, and 3) a good habitat for the bees.

First, keep in mind that nobody likes bees but a beekeeper and most people do not want to see bees at all. If you live in an urban environment and you want to keep your bees where you live place your hives so they cannot be seen by snoopy neighbors looking over backyard fences, or people just walking by. When you have friends or neighbors over for a backyard cook-out or something similar, fix the bees so they can be neither seen nor heard.

Paint your hives a color that will blend in with your backyard, a shade of green for instance. Or if they are next to your red brick house, a shade of red. Consider making a fence using four foot square pallets placed on old tires or concrete blocks to block visibility. These can be tied to one or two fence posts and serve a dual purpose of blocking both visibility and strong winds.

One terrible example of where not to place bees is that of a new beekeeper I worked with in Tucson. He wanted to see his bees all the time he was home, so he placed them in his front yard driveway, about 200 feet from the street. Within 48 hours the city served him a notice to remove the bees.

In rural areas it is still best to hide colonies from prying eyes and if possible to place them near the home of someone sympathetic to your needs. This may be a farmer who wants free pollination in exchange for your bee yard placement.

Isolated rural areas where bees are visible are targets for would-be thieves and vandals. On one occasion someone used the front handhold of my hive as a bulls-eye for target practice. I counted 30 22-caliber slugs on the bottom board. It really didn't do much damage but it made me angry at the idiot who did the shooting.

When you have an aggressive hive (this happens to every beekeeper at one time or another) find the queen and replace her. Get a friend to come over to help if you need to.

With lots of smoke open the hive quickly and place a queen excluder between each box, which will isolate the queen into one box and make her easier to find. With two or three people working this can be done in about two minutes. Come back in five days, look for eggs and that will be the box with the queen. Put the hive back together again quickly, putting the box with the queen on the top, over a queen excluder. Again with two or three people helping this can be done in three minutes.

Now you have the queen where she can be found with ease and minimum disturbance, right under the cover and on just nine or 10 frames. She should be relatively easy to find now. If you still have trouble finding her kill the bees in the colony and start all over with a package – a radical, but perhaps necessary move.

There are at least two techniques of working really mean bees. George Woyke of Warsaw, Poland told me how he worked Africanized bees in Brazil. After opening the hive and setting the supers aside, he would go through the brood nest by exposing one comb only. All the other combs would be covered with a piece of wet cloth. The second method I saw on a visit to South Africa where the beekeeper kept his bees near a settlement for protection against vandals. He would begin his bee work after the sun went down and his workers had small lights affixed to their veils. (When working bees at night be sure your clothes have been sealed to prevent any bee entry. Bees won't fly much at night, but they will crawl all over you and when they find skin – they sting.) He said that by morning those notoriously aggressive African bees would be all calmed down and never bother the people living nearby.

Last, give some honey to the people who live near your colonies. It is absolutely amazing how a small gift will spread good will. When you give the honey, explain how important proper pollination is to people with gardens and to farmers (Example: cantaloupes require visits from at least 12 bees to set a good fruit.)

> Another name for beekeeping could be . . . "Carrying heavy loads around all the time."

Continued on Next Page

"Would your *family* want to live here?"

CHOOSING ... Cont. Fom Pg. 285

The second consideration in selecting a bee yard location is convenience. Soon you will realize another name for beekeeping is "carry heavy loads around all the time hobby" A ten-frame deep full of honey weighs about 80 pounds (36 kg). A gallon of honey weighs 12 pounds. An empty hive, devoid of bees, but with comb weighs about 40 pounds. A complete hive with bees, brood and some honey will weigh over a hundred pounds.

The reason for giving you all those figures is to make you realize that you should place your hives to minimize toting all that heavy equipment any further than you absolutely have to. And don't forget you may have to tend your bees when the ground is either covered with snow or ankle deep in mud – unless you plan ahead.

The worst location I ever worked was on the side of a cliff in the Catskill Mountains and was appropriately named "Cliff Yard" It had about 50 colonies and they made lots of honey, all in 10-frame deeps. These had to be hand-carried up the cliff to the waiting truck and empty deeps were carried back. Fortunately in those days I was young (18), stupid, and strong with a good back and legs. So was the rest of the crew who worked for this 2000-colony commercial beekeeper.

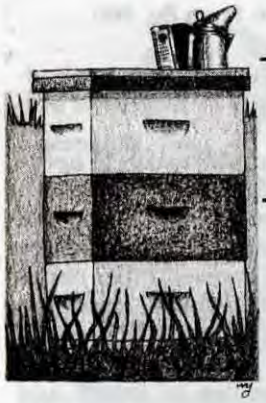
The third and last consideration is to the bees themselves. Remember that your bees are alive but they have no say in where you put them. Take a moment and stand where the bees will be placed. Figure out which ways are north and west. In most places, about once or twice a year, strong westerly or north-westerly winds will be blowing, interfering with bee flight during warm weather and bringing down a severe chill in winter. Think about a wind break.

Would you like to live right there, at that spot? Would your wife or husband? Is it going to be stifling hot in July, damp and cold in winter?

The most beautiful bee yard location I have ever seen was in Iowa, near the Skunk River and about 10 miles from the village of Pella. The owner told me he was hunting in the hills when he saw this spot. It was like a broken bowl, with one side open to the south and east and the surrounding hillside dotted with oaks. He immediately looked up the owner and made an offer to buy, which was accepted, then built a small cabin for himself and wife and moved about 120 hives of bees there.

The gentle slope provided easy access for his wheelbarrow so full honey supers could be brought to the honey-house cabin. Empty supers were wheeled back up the slope. The year I visited him, 1945, was one of the best honey years on record and he averaged about 300 pounds from each hive.

This example covers all aspects thought out I have been discussing in this article. It was isolated from all people who were not interested in bees; the nearest neighbor and public road were at least a quarter mile away. Since the beekeeper lived there, he had no problems with theft and vandalism and had a minimum of carrying and lifting of heavy equipment. As for the bees, there was enough shade from the oaks during summer and southern exposure made easy wintering for Iowa's severe winters. An ideal apiary site.



BEE TALK

richard taylor

There are only a few rules to follow to have a bait hive be successful.

Let's talk about bait hives. These have a place in sideline beekeeping and can considerably improve its profitability, not to mention the fun of setting them out and finding that you have caught valuable swarms. Most swarms, whether from your own hives or another's, or from feral colonies, are never recovered by any beekeeper, but bait hives will collect quite a few of them. And a swarm, especially in May or early June, is a thing of value, worth considerably more than a mail-order package of bees.

Bait hives can be purchased, but there is no need to spend money this way. An ordinary beehive, with its entrance reduced and a few scraps of dark comb inside probably works just as well if it is properly placed. A winter-killed colony can be cleaned up, right there in the apiary, and used as a bait hive. Simply set any such hive on top of another hive in the apiary and it will very likely be taken over by a stray swarm, though the likelihood of this is increased if that bait hive is raised a bit higher, by fixing it in a tree, for example. If the colony has succumbed to tracheal mites, however, and still has quite a lot of honey in it, then it will usually be better to revive it by putting a few – three or more – combs of brood and bees in it and giving the small colony thus created a new queen.

Bait hives offered for sale sometimes contain a synthetic pheromone attractive to bees, but this is of less importance than one might suppose. It is not the swarm itself that selects a nesting cavity, but rather, scout bees. All that is needed, therefore, is a bait hive that will catch the *attention* of scout bees. These scout bees begin looking into possible nesting cavities even before the swarm emerges, and then often continue their selection process while the swarm hangs clustered. Once they decide that a given cavity is acceptable, and convince the rest of the bees that it is then the swarm will follow. And if the other requirements of a bait hive are met, then scraps of old, dark honey comb are probably as good for attracting the notice of scout bees as any pheromone. I suspect anise oil extract would also work, as its fragrance is easily picked up by any honey bee. But in fact, no attractant other than the bait hive itself is really needed. Putting honey in the bait hive is totally useless, since this will only attract foraging bees or, more likely, ants, rather than scout bees.

Swarms are, in my experience, almost never drawn to *bait hives* placed on the ground, even though this is how apiaries themselves are invariably set out, for the convenience of the beekeeper. Often, on the other hand, stray swarms take over ground level *dead hives*. It is evidently the abundance of drawn combs that attracts them. If supers containing combs are stored outside, even in places not attractive to bees, then they are likely to be taken over by stray swarms, the scout bees having found some hole or crack in the stack. I have known three swarms to take over a couple stacks of supers in one season even though they were stacked on a deeply shaded side of my barn and contained moth crystals (paradichlorobenzene) which are highly repellent to bees. (A visiting beekeeper from another state who came by when I was away saw these "hives" and, as he told me later, concluded that I was a pretty slovenly beekeeper!). On another occasion a swarm took over a stack of supers stored inside my garage. I strongly suspect that drawn combs, especially old dark ones, or even a few scraps of these, are more attractive to the scout bees than any pheromone.

Other conditions are, of course, important in determining a nesting site, and scout bees have quite definite though not very precise criteria of selection. And here, again, it must be borne in mind that it is a few scout bees that make the final decision, not the swarm itself. The swarm simply responds to the choice made by the scouts. All but a few of the thousands of bees in a swarm will be totally unfamiliar with the new nesting site until they move into it, suddenly and all together.

It is, incidentally, one of the wonders of beekeeping and, indeed, one of the wonders of creation that the solitary scout bee who first discovers this nesting site, and who measures its volume and otherwise assesses its suitability before recruiting other scouts to come see what she has found, is thereby doing something, with considerable precision and "judgement", that she has never done before in her life!

In addition to containing scraps of dark comb, a bait hive should be about ten or twelve feet from the ground, should be of about the same volume as a regular full-depth hive body, should have a small entrance hole near the bottom, and should, preferably, face south. Such a bait hive can be fastened to a tree trunk, in which case it is best to have it near the edge of the woodlot rather than deep in the woods. The entrance hole,

Continued on Next Page

BEE TALK ... Cont. From Pg. 287

if large enough for birds to enter, should have a couple of cross wires or a scrap of hardware screen to discourage bird nesting.

Unless you are using a regular hive with a full set of combs or combs plus foundation as your bait hive, you should get the swarms you collect into a proper hive as soon as possible. A prime swarm builds comb with astounding speed, and you can have a sticky mess on your hands if you put off getting it out of the bait hive. Remember though, leaving unattended brood comb in an enclosed dark place for any length of time will attract wax moths. Guaranteed. Take down your bait hives at the end of the season, and count your newly found hives.

INNER COVER ... Cont. From Pg. 240

•

Speaking of the global marketplace, the European community has been working hard to support their farmers the last couple of years. In 1991 and '92 they spent $24.3 and $25.7 billion, respectively, on domestic support. Meanwhile, in the U.S. we spent $9.4 and $8.3 billion. Coupled with some pretty hefty import restrictions it's no wonder the world's honey producers are looking at our store shelves, and not Europe's.

•

We took a somewhat different approach to our annual honey report this year. Each May we do a summary of what's been going on in the industry, drawing on the data we collect from our reporters, the USDA, Commerce Dept. and others. We usually present the current year's data by region and by month, along with a comparison of the last five or six years, to give you a feel for what's been going on.

This time we took a look at the people who give us those numbers – Our Reporters. We looked at how many bees they keep, how much honey they sell, how they sell it and lots more. If you've ever wondered where those numbers come from, and who makes them happen, check out our Annual Report this month.

Kim Flottum

BOTTOM ... Cont. From Pg. 300

efficiency, so the beekeeper will already be thinking of increased production.

A further consideration in keeping fireflies in the hive is their food. Mostly, they eat other insects – an obvious problem if we house them with the bees. However, other carnivores, dogs and cats for instance, have been successfully fed a partially vegetable diet, so perhaps we can interest the fireflies in honey and pollen. Alternatively, we can train them to leave the hive to eat.

I have to admit, I am leaning towards the crossbreeding. It would eliminate a lot of the problems. If we do go that route should we be working towards a single species of firebee that replaces the honey bee completely, or a species that supplements the honey bee? And how do we factor the Africanized bee into the equation. Perhaps I shouldn't mention it but I suppose there is always the chance of developing, inadvertently of course, a night-flying, Africanized firebee. If you took enough stings from a colony of those, you wouldn't need to carry a flashlight.

If any of you are doing work along these lines, I would like to hear from you. I understand that someone has been working on crossing yellow jackets with butterflies with the idea of replacing yellow jackets with a kinder, gentler insect. I'm sure I could learn a lot from this individual but I haven't been able to track him down.

QUESTIONS?

Mite Free

Q. My bees died this winter, I presume from mites. Can I put new packages in the hives in the spring, on the same combs, or will there still be mites on them?

Rick Reakoff
Lucas, IA

A. Yes, you can install package bees without further precautions. Neither tracheal or varroa mites contaminate the combs or equipment.

Double Screen

Q. How does one split a colony of bees to get two colonies, using a double screen?

James Lee
Odessa, FL

A. If you insert a double screen, or even just a sheet of plywood, between the two stories of a two-story hive and provide an entrance for the top half, preferably at the back of the hive, then whichever half is thus deprived of a queen will raise a new one. When the new queen begins to lay eggs, then either part of the hive can be moved to a new hive stand, and you have two colonies.

No Queen Aroma

Q. If you use a double screen to divide a colony, leaving the old queen below, does not the pheromone sent up through the screen by the old queen cause the bees up there to think they still have a queen, so that they will reject any new one?

John Anderson
Arcola, IL

A. No. The colony is kept together, not by an odor from the queen, but by a queen substance, as it is called, which the bees are made aware of by the actual contact with the queen and by spreading it throughout the colony by touching other bees.

3 Story Split

Q. I want to split a three-story hive. How can I keep the split in the same apiary as the parent hive?

Craig Pullman
Arma, KS

A. Very easy. Be sure the heaviest story, with the honey, remains on the parent stand, set one of the other stories, containing plenty of brood and bees, and maybe a half comb of honey on a new stand in the same apiary and give it a new queen, making sure that the original queen remains with the parent colony. That way the bees will not rob the honey and take it back to the original stand (since it is already there), and the split will readily accept a new queen (since all the older, aggressive bees will have returned to the original stand). You may want to more or less plug the entrance of the split for an hour or two, with some grass, to discourage too many bees from returning to parent stand.

Shook Swarm I

Q. I want to try the shook swarm method of getting comb honey. Here the main honey flow starts around mid to late June. When should I do the shook swarming? And can bees from two different hives be shaken together into one shallow extracting super?

Henry Yoder
Flemingsburg, KY

A. You can do the shook swarming as soon as you think there is sufficient bloom to sustain the bees, then they should be good and ready when the main flow starts. I always did it when the dandelions were in full bloom. I do not think it works well to combine the bees from two colonies, although it can be done. The strong colony of bees will give you plenty of foragers. There is, incidentally, a problem with the shook swarm system, namely, you are apt to get plugs of pollen in the comb honey.

Shook Swarm II

Q. I used the shook swarm method this past summer for four round-section supers, and got 112 finished sections. But 72 of these had pollen in them and were unsaleable, leaving me only 40 good ones. I used a queen excluder under the supers. Is there any way to keep pollen out of the round-section supers?

John Cleft
Myses, MN

A. This is, in many areas, a major problem with the shook swarm system, or with any system that requires radical reduction of the brood chamber. It is not a fault of the round sections as such. This is one of the reasons I never use the shook swarm method anymore.

Bees, by nature, store pollen *below* where honey has been stored. Hence, if there is a considerable amount of honey in the tops of the combs when the supers go onto the hives, then you will almost never see pollen in the sections. My own method is to be sure there is honey still in the hive from the previous season. This honey barrier serves as a natural queen excluder, keeping all brood and pollen down in the hive.

Questions are welcomed. Address Dr. Richard Taylor, Box 352, Interlaken, NY 14847, enclosing stamped envelope.

ANSWERS!

Richard Taylor

?Do You Know? Answers

1. **False** There is no seasonal outbreak of American foulbrood. The disease occurs at any time of the year when brood is present. Once a colony becomes infected, the number of infected larvae gradually increases since diseased larvae (scales) serve as a spore reservoir.
2. **True** European foulbrood kills larvae when they are 4 or 5 days old before the cell is capped and American foulbrood kills after the cell is capped either in the prepupa or pupal stage.
3. **True** The typical European foulbrood diseased larva contains a complex microflora. In addition to the causative bacterium *Melissococcus pluton*, other associated organisms, such as *Bacillus alvei*, *Bacillus laterosporus* and *Enterococcus faecalis* may also be present and affect the odor and consistencty of the dead brood.
4. **False** When an individual finds brood of all ages killed at the same time and at the edge of the broodnest this would usually be chilled brood, not chalkbrood. There is no single brood disease that kills equally in the egg, larval, and pupal stages.
5. **False** Terramycin (Oxytetracycline HCL) kills only the vegetative rod phase of *Bacillus larvae* and not the spore stage of American foulbrood.
6. **False** Larvae that die from European foulbrood decompose rapidly and are left by the adult bees to dry to a scale that is easily removed. American foulbrood scales, on the other hand, adhere tightly to the lower cell wall and are difficult for the bees to remove.
7. **True** *Nosema apis* spores rarely occur in honey or pollen since the disease is most prevalent during winter confinement prior to the availability of floral sources. During confinement, spores are spread in the fecal matter of adult bees and are ingested by young individuals when they clean contaminated combs. When bees are able to fly freely, they defecate away from the colony, the combs become cleaner and the chances of bees or food stores becoming contaminated decreases.
8. **False** Although nosema disease is likely to aggrevate dysentery since it is an inflamation of the digestive tract, there is no evidence to suggest that it is the cause of dysentery. An accumulation of water in the diet and fecal matter is the primary cause of dysentery.
9. **True** Amoeba disease is caused by a protozoan that infects the malpighian tubules of adult bees. The effect of the infection on colonies is uncertain at this time.
10. **C.** American Foulbrood
11. **B.** American Foulbrood
12. **E.** Bacterial spores
13. **C.** Viral cells
14. **B.** Fungal spores
15. **A.** Bacterial vegetative cells
16. **A.** Sacbrood
17. **D.** European Foulbrood
18. **C.** American Foulbrood
19. **B.** Chalkbrood
20. **H.** Chronic Bee Paralysis
21. *Prompt uncapping of a cell containing a diseased larva which is controlled by a recessive gene.
    *Removal of a diseased larva before it hardens into an adhering scale which is controlled by a second recessive gene.
    *A young larva quickly becomes resistant to infection as it ages.
    *The efficiency of adults in filtering the spores of *Bacillus larvae* from larval food by means of their proventriculus.
    *The efficiency of a bactericidal factor in the gland secretions of nurse bees.
22. C. Terramycin is mixed with sugar and vegetable oil or petroleum jelly to form extender patties which are placed on the top bars of the brood combs. **OR**
    B. Terramycin is mixed in fine powdered (icing) sugar and sprinkled over the tops of the brood frames.
23. * ETO residues are thought to be carcinogenic.
    * The high cost of treatment.
    * Diseased equipment has to be hauled to a chamber or central location.
    *The flammability of the gas mixtures used.
    * Varying results due to protection of the American foulbrood spores by honey, wax and pollen in the combs.

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

GLEANINGS

MAY, 1993 ALL THE NEWS THAT FITS

And Gets Married, Too

CARON ELECTED ENT. SOC. PRES.

Dewey Caron, former apiculturist at the University of Maryland (1970-1981), was recently elected President of the Eastern Branch, Entomological Society of America. He serves as President-elect until next February and then as President from 1994 until meetings in late February 1995 at Harrisburg, PA.

Dewey continues as Board Chairman of the Eastern Apicultural Society (EAS). EAS meets in Maine this summer and next year in Lancaster, PA. Since leaving Maryland, Dewey served 3-1/2 years as Chairman of the Department of Entomology & Applied Ecology of the University of Delaware. He currently is Professor of Entomology and Extension Entomologist for Delaware.

Dewey is most frequently found studying whiteflies in greenhouses or working with insects that are pests of plants (horticulture entomology). He continues his research on African bees in Central and South America and continues honey bee pollination biology research and studies on bee pests.

While conducting African bee studies abroad Dewey met and recently married Nieves Rivero, an Ag-economist from Bolivia. Best wishes to the new "queen" in the Caron Hive.

From The Killion Collection

QUEEN FINDING VIDEO RELEASED

Queen Bee Finding, Marking and Clipping is a 24-minute video produced by Gene Killion, Extension Specialist in Apiculture, University of Illinois.

It gives a step-by-step demonstration and explanation of this important part of hive management. You will see each part of the process carried out, as you hear basic scientific information as well as procedural tips and pointers. This program will enable any interested beekeeper to successfully complete the task.

The price is $45. To order contact: Film Center, University of IL 1325 South Oak, Champaign, IL 61820 or call 1-800-367-3456. Ask for Film Center #X00052.

Downsizing and Budget Cutting, For Sure

ESPY REORGANIZES USDA

Administration officials are still exploring a variety of approaches to U.S. Department of Agriculture reorganization, both in Washington, DC and in the field. At the field level, state Food and Agriculture Councils (FACs) are preparing plans to implement former Secretary Edward Madigan's field office closing orders. Agriculture Secretary Mike Espy recently sent a memo to FAC heads indicating his interest in reviewing the plans, due April 19.

However, this is not a cause for panic. Espy is NOT instructing the FACs to implement the plans, but is instead offering local leaders the opportunity for input in the event that future reorganization efforts focus on some of the same offices targeted by Madigan.

"(But) before we implement any full scale USDA field office closings, I want to review the study which led to the Madigan plan in detail, and I want to review the Washington-level USDA structure," Espy explained.

As one of his first steps towards reorganizing the department's top-level bureaucracy, on Feb. 11 Espy announced plans to establish a new USDA Office of Communications. The office would assume the responsibilities of the old USDA Office of Public Affairs, as well as public affairs functions conducted by individual USDA agencies. It is still not clear how regional, state and local public affairs personnel would be affected.

Further complicating the reorganization issue is a recent executive order issued by president Clinton, calling for the elimination of 100,000 federal jobs. All departments and agencies with more than 100 employees have been instructed to eliminate at least four percent of their civilian personnel positions over the next three fiscal years through attrition and "early out" programs. The Office of Management and Budget must still issue detailed instructions regarding implementation of this plan.

MICHIGAN QUEEN

Connie Jaracz is the 1993 Michigan Honey Queen.

She is the daughter of Julian and Christine Jaracz of Posen, Michigan. She is presently a freshman at Oakland University majoring in political science.

She is looking forward to a busy year attending fairs, parades, visiting orchards and Michigan Beekeepers events.

Fewer Farmers

LESS POLITICAL CLOUT

Have farmers lost their political clout? Carl Zulauf says yes, but the decline has been slow. The Ohio State University agricultural economist says shifting population centers are largely to blame. With representation based on population, the number or urban legislators in the U.S. House of Representatives has grown rapidly in the last 40 years. That means an increasing interest in consumer issues and little knowledge of farming. Luckily for agriculture, the U.S. Senate's membership isn't based on population. With at least 40 states having agriculture as a significant industry, Senators cannot afford to lose sight of food and fiber interests. What is sure, Zulauf says, is that the days of blank-check farm policy are gone forever. Farm-supporting legislators need the votes of their city cousins to build policy. The gradual decline in political power gives farmers an opportunity to forget the old ways of negotiating policy and learn to become proactive diplomats in a diverse political arena. The quicker this transition is made, the more effective farm and food policy will be for all.

New & Old Members

HOUSE & SENATE CONTACTS

U.S. House of Representatives
Committee on Agriculture
103rd Congress
E. "Kika" de la Garza
D-Texas, Chairman

George E. Brown Jr., D-CA
Charlie Rose, D-NC
Glenn English, D-OK
Dan Glickman, D-KS
Charles W. Stenholm, D-TX
Harold L. Volkmer, D-MO
Timothy J. Penny, D-MN
Tim Johnson, D-SD
Bill Sarpalius, D-TX
Jill L. Long, D-IN
Gary Condit, D-CA
Collin C. Peterson, D-MN
Calvin M. Dooley, D-CA
*Eva M. Clayton, D-NC
*David Minge, D-MN
*Earl F. Hilliard, D-AL
*Jay Inslee, D-WA
*Tom Barlow, D-KY
*Earl Pomeroy, D-ND
*Tom Holden, D-PA
*Cynthia McKinney, D-GA
*Scott Baesler, D-KY
*Karen L. Thurman, D-FL
*Sanford Bishop Jr., D-GA
Pat Roberts, R-KS
Bill Emerson, R-MO
Steve Gunderson, R-WI
Tom Lewis, R-FL
Robert F. Smith, R-OR
Larry Combest, R-TX
Dave Camp, R-MI
Wayne Allard, R-CO
Bill Barrett, R-NE
Jim Nussle, R-IA
John A. Boehner, R-OH
Thomas W. Ewing, R-IL
*John Doolittle, R-CA
*Jack Kingston, R-GA
*Robert Goodlatte, R-VA
*Jay Dickey, R-AR
*Richard Pombo, R-CA
*Charles Canady, R-FL

U.S. Senate
Committee on Agriculture,
Nutrition and Forestry
103rd Congress
Patrick J. Leahy, D-VT
Chairman

David Pryor, D-AR
David Boren, D-OK
Howell T. Heflin, D-AL
Tom Harkin, D-IA
Kent Conrad, D-ND
Thomas A. Daschle, D-SD
Max Baucus, D-MT
J. Robert Kerrey, D-NE
Russell Feingold, D-WI
Richard G. Lugar, R-IN
Bob Dole, R-KS
Jesse Helms, R-NC
Thad Cochran, R-MS
Mitch McConnel, R-KY
Larry E. Craig, R-ID
*Charles E. Grassley, R-IA
*Paul Coverdell, R-GA

*new member

AFRICAN HONEY BEE UPDATE

With the swarming season nearly upon us, our trap inspectors have been busy rebaiting traps and replacing those destroyed by rain or wind. The Harlingen laboratory began receiving bee samples from stinging incidents in the middle of February.

Our trap inspectors gave a presentation to the Del Rio Literacy Council on how to prevent stinging incidents and general information about the Africanized honey bee. The presentation was so well received that several Del Rio businesses, such as Wal-Mart, McDonald's, Rio Grande Electric Cooperative, and a local supermarket have united and provided funding to reprint the AHB Awareness Pamphlet developed by Texas A&M and Extension Service.

The pamphlet has been printed in both English and Spanish. On the back of the pamphlet, USDA's bee logo is displayed as well as a statement saying "Provided for you by your local (business).

There were 24 traps installed on Hwy. 6 from Texas City to Alvin. From there, additional traps will be installed westward on FM 1462 to meet with the existing trapline on Hwy. 36. The new line is about 20 miles south of Houston. Another 40 traps were installed on FM 652 in Loving, Reeves and Culberson counties, just south of the border with New Mexico. We currently service some 750 traps; Texas A&M University Apiary Inspection Service has approximately 400 traps in service.

The laboratory analyzed two bee samples: one from Corpus Christi was identified as European with introgression of Africanized genes (EAB). A woman had just tied up her dog to bathe it when she was stung several times by bees colonized in a vacant house next door. The woman escaped, but her dog was less fortunate and died. The second sample was from a feral swarm at a local school. It was identified as AHB.

Texas A&M laboratory identified seven AHB and nine EHB samples, all of which were of feral origin. One AHB sample came from 12 miles north of Austin; the swarm was in a tree two miles east of Round Rock in Williamson County. Texas A&M placed Williamson County under quarantine on February 26.

Two trap inspectors from the Waco area began working for the Africanized Honey Bee program on April 12, 1993. They will be responsible for trap lines in the central and eastern part of Texas.

The trap line along highway 87 from San Antonio to Cuero has been removed. This trap line had 60 traps in place. We now have 706 traps in service.

The laboratories report the following numbers of samples for the entire month of March, 1993.

Samples from:

	APHIS		TEXAS A&M		ARS		
	EHB	AHB	EHB	AHB	EHB	AHB	SUSP.
Traps	1	0	0	0	—		2
Feral	0	3	30	4	0	0	0

The number of traps from El Paso to Esperanza, Texas along the Rio Grande River has increased to 29. Beginning in April this trap line will be inspected every other week instead of once per month.

SUGAR CONSUMPTION UP

Domestic sugar production in fiscal year 1993 is forecast at a record 7.7 million tons, up 6 percent from 1992. Beet sugar will contribute more than half of production, at 4.3 million tons, and cane sugar at 3.4 million tons. Domestic sugar deliveries are forecast at 9 million tons, higher than any year since 1982. U.S. per capita sugar consumption in fiscal 1993 for food and beverage use is forecast at 64 pounds, nearly 5 pounds higher than in the mid-1980's.

HONEY BOARD NEWS

LABEL APPEAL

An appealing label can give your honey sales a boost.

According to a label research study sponsored by the National Honey Board, however, many honey labels do not motivate a consumer to purchase. In fact, some common honey label graphics are viewed negatively by the typical honey consumer.

The study, conducted by Executive Solutions Incorporated, Bayville, NY, was designed to gauge consumer response to color, words and graphical images on honey labels. The study involved focus group discussions followed by quantitative research (one-on-one interviews conducted in four major cities). The research participants were females who are primary household shoppers, age 25-49. What makes these shoppers pick one jar of honey over another?

The study showed that the three most important attributes to be conveyed on a honey label are quality, pure and natural.

"Consumers buy honey for its great taste and its downhome qualities," said Mary Humann, marketing director for the National Honey Board. "Honey labels should convey a pure, natural and wholesome image."

Higher purchase interest (19 percent) was also noted for labels which included a local address. Local honey was often considered to be of higher quality and higher purity. Interestingly, "American" was not associated with higher purchase interest. The study reported "taken in combination with other findings, this suggests that it may be better to imply country of origin with local identification or an address rather than to directly state 'American' on the label."

While the study participants liked the idea of a cute bee or bear on the label, many responded negatively to realistic bee and beekeeping images. Producer/packers must remember that the typical honey buyer is anxious about bees, said Humann.

"When she sees a realistic bee, she thinks of being stung or insects in her home. It's just not a positive message," Humann said.

One participant in the study said "I've got a thing about bees – if I've got to grab that jar, in my mind I'm grabbing that bee." Another said "I wouldn't buy it with a bee – I wouldn't touch it." "I just don't like bugs," said one participant.

Other images which may lower a consumer's purchase interest included fruit and honey combs. Flowers and skeps yielded a neutral response. Cute bees and bears were viewed positively. The "Honey Nut Cheerios bee" was often cited as a cute bee. One participant noted that the bee should be "cute, friendly and happy."

The study did not determine specific colors which are best on honey labels. Executive Solutions, however, noted that there is a "general trend towards bright colors for packaging."

The study participants preferred labels which had a shape similar to the container yet allowed them to view the honey.

The majority of participants (85 percent) said that nutritional information on honey containers is extremely or very important. Most honey users do not understand honey's nutritional profile and would like clarification that honey is a fat-free and cholesterol-free food. Respondents also said calories per serving is important information.

Consumers also want basic honey storage and use tips on the label. Information on how to substitute honey for sugar was also deemed important.

The study was conducted by the Honey Board to coincide with new nutritional labeling requirements required by the U.S. Food and Drug Administration.

Final nutritional labeling regulations published in January will require businesses with gross sales over $500,000 to include a nutritional label on their food products. Also, any product that includes a nutritional claim must include a nutritional label.

Since the nutrients found in honey are minimal, honey labels can use a simplified format. A honey label requires this information: total calories, total fat, sodium, total carbohydrates, sugars, protein, serving size and servings per container. The serving size for honey has been set by the government at one tablespoon (21 g).

The Food and Drug Administration has established a very specific layout for the nutritional information. There are rules on type size and how the information should look on the label. The National Honey Board has prepared a brochure which shows a standard nutritional label for honey and explains the new labeling laws.

For a copy of "Giving Your Honey Label Appeal" brochure, write to National Honey Board, 421 21st Ave. #203, Longmont, CO 80513.

The largest exhibition of U.S. food and beverage products ever held outside the United States will be conducted in Mexico City in August. USDA's Foreign Agricultural Service is now recruiting U.S. exporters to exhibit at U.S. Food Festival '93. 170 booths are available to exporters of dairy products, beef, poultry, eggs, deciduous fruits, frozen foods, breakfast cereals, seafood, ethnic foods, and alcoholic beverages.

Send Your Meeting Notices to *Bee Culture* at least TWO MONTHS in Advance.

Do you know of a bakery which uses honey as the primary sweetener? Is there a food manufacturer in your area that makes a unique honey product? Does your local restaurant make the best honey mustard dressing you ever tasted?

If so, the National Honey Board wants to hear about them.

Let us know about your outstanding honey customer and we'll add them to Honey Board mailing lists. The Board sends out information on new honey research and the honey bear logo program. Also, the Honey Board will include information about bakers, chefs and restaurant operators who love to use honey. "We have a program to generate publicity for these important honey users," said Humann. "We need to hear from producer/packers about their customers to maintain an active program."

For more information on how you or your customers can participate in the Honey Board's programs, call or write: National Honey Board, 421 21st Ave. #203, Longmont, CO 80513, (303) 776-2337.

MEAD JOURNAL RELEASED

American Mead Association Director Susanne Price is proud to announce the release of the Spring 93 MeadLetters containing articles from Byron Burch: *Meet Me At The Corner of Mead and Wine,* and Jim Reynolds (Arizona): *Enhancing The Romance of Mead,* and informative guide for beginners on candlemaking. You can subscribe to the quarterly MeadLetters by sending $12 (foreign add $6) to the AMA at P.O. Box 17511, Boulder, CO 80308.

It is estimated there are over 80,000 meadmakers on Earth. This number is growing, as people find the six hours spent making a batch of mead is relaxing as well as fun, and fermentation takes less than two months. Best of all, mead is inexpensive to make, and the ancient history surrounding its mystique ties into the very beginnings of bee culture.

Display Index

Firebees Have Promise

richard bonney

BOTTOM·BOARD

It all began with a casual comment from my friend, Roland. I don't remember the context of the remark but the gist of it was that there might be some advantages in crossing honey bees with fireflies. I thought about that for several days and decided that, yes, there could be advantages. After all, it's dark in the hive. Think of the limitations that darkness brings about. If the bees could just have some light.

Take the queen, for instance. She cannot just peek into a cell and see if it's empty. She has to stick her antennae down in there and check things out. The extra time and inconvenience per egg is small, perhaps, but when you consider 1000 eggs per day and more, the time adds up. The workers have a similar problem. They cannot see what is going on in a cell. They must get down in there, too. Does the pollen need to be packed? Is there room for a little more honey? Does this larva need food? If they could only see, it would be so much quicker. The very young bees would have a faster learning curve. It's bad enough that they face a lifetime of work, work, work, but they must learn it all in the dark. If they could just see how the older bees do things, they could learn so much quicker. More efficiency means getting through those household chores faster and graduating to field bees sooner. And that's what it is all about. Get those workers out into the field.

Think of the potential advantages for field bees, too. Scouts, searching out suitable sites for a swarm could check the dark interior of hollow trees so much more efficiently. And what about nighttime foraging. Of course, there isn't as much nectar available at night, but moths manage to make a living, so there's something out there — and perhaps we can encourage the plant scientists to develop more night blooming nectar sources. I thought this all over and it sounded great to me so we got to work on the problem. We're working it from two different directions. First, actually crossing fireflies with bees, so that the resulting *firebee* can carry its own light. I'll come back to that.

The second approach is to train fireflies to act as beacons and light sources. We haven't gotten too much past the thinking stage with this approach yet, but there are at least two different directions we could go. Fireflies could fly out at night and go to flowers that are actively secreting nectar. Bees could home in on the fireflies. Depending on distances and terrain, this might require spotting fireflies along the flight paths, so the bees would not get lost over longer distances. Alternatively, one or two fireflies could be assigned to work with each field bee, acting as guides. They would fly together to and from the hive. This, of course, would require that the fireflies first be trained to recognize and locate nectar plants.

In the hive, strategically located fireflies could provide a continuous light source. Since presumably they would be standing idle while doing this, perhaps we could train them to fan their wings at the same time in warm weather.

As I stated, this training approach is still primarily in the thinking stage. The other approach, crossbreeding, might work better for some of these activities and this is where we have been actively working. Breeding certain capabilities into a new hybrid species will probably be easier than training an existing species that has evolved over millions of years. They are set in their ways by now. Of course, crossing bees and fireflies has some obvious problems. Their relationship is very remote. Both are insects, obviously, but bees are of the order hymenoptera, while fireflies are beetles, of the order coleoptera. Genetically, crossing them is a problem akin to crossing, say, a squirrel with a bat, or a lion with a goat. Genetic engineering has great promise though, and we are very hopeful. I won't get into any detail here on progress to date, but I will admit that I recently received a sting that glowed for several days. I didn't mind that particularly, but the firebee had no wax glands or pollen baskets. We have a long way to go with this.

We aren't ready to say that either approach is better. It's too early and there are many tradeoffs to be explored. Keeping fireflies in the hive probably means more space will be required, or perhaps it means the beekeeper must take off honey more often to prevent congestion. Of course, this scheme is going to mean more honey anyhow because of increased

Continued on Page 288