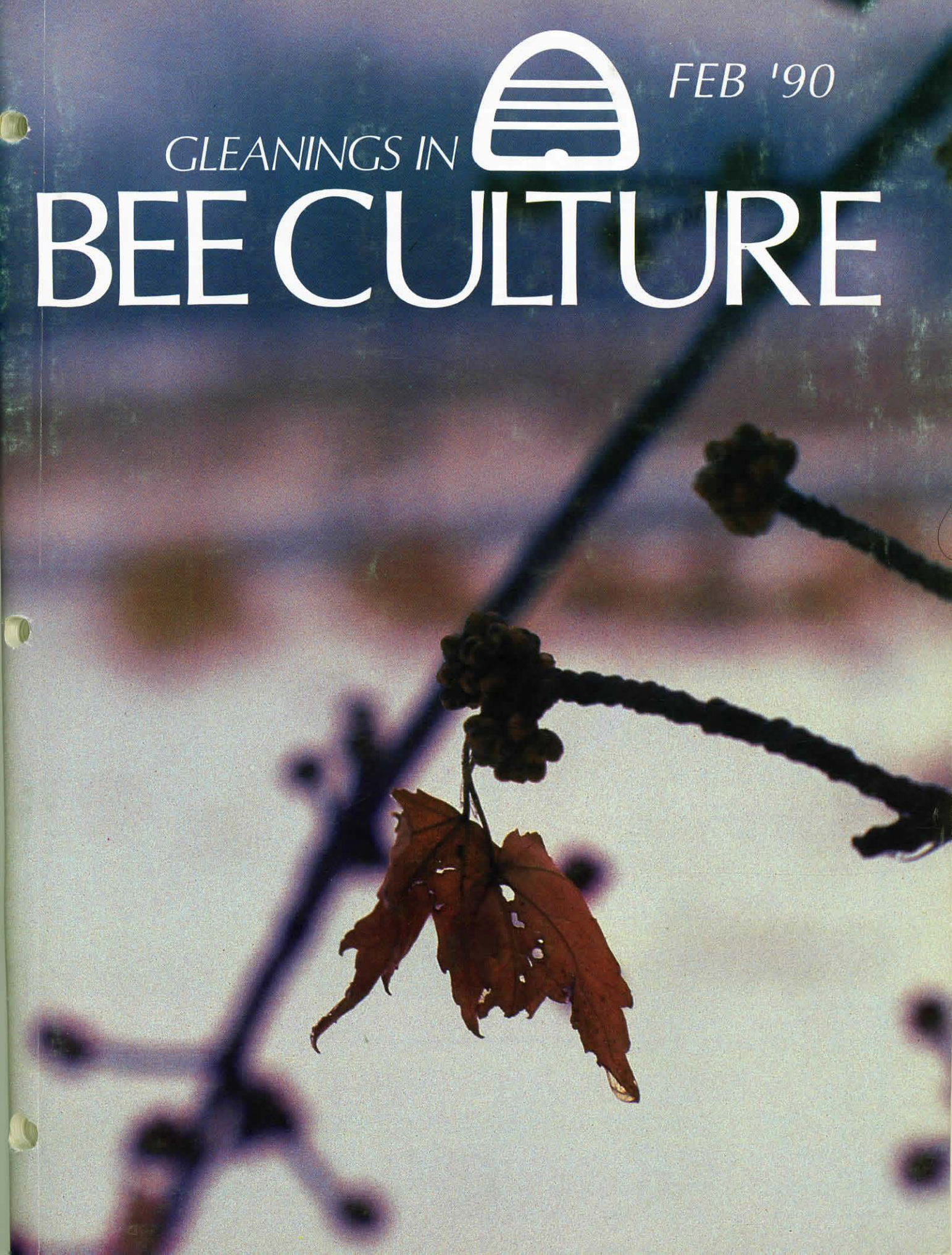
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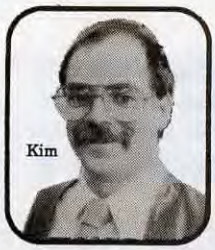

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COVER ... When maple buds begin to swell, spring is close at hand — no matter how bad the weather, no matter how long the nights.

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INNER·COVER

As you are no doubt aware, January is the month the two National groups hold their annual let's-go-somewhere-warm meetings. The American Honey Producers (AHP) gathered in Tucson, AZ, with lots of fun in the sun — a golf tournament, tours and shopping. Plus, there were excellent speakers covering lots of topics and a room full of exhibits. If you didn't make it (like me) I'm told it was well worth the price and time for any beekeeper to attend.

A week or so later the American Beekeeping Federation (ABF) held their pow-wow in Las Vegas, NV. Another great meeting, with tours and shopping, speakers, exhibits and workshops. Again, truly worth the time and expense for any beekeeper.

Both meetings featured the latest on tracheal and varroa mites, the 1990 farm bill, marketing, the Honey Board, basic and advanced beekeeping skills, and more.

Of course, each had their own political sessions, with their hard core backers and their own rituals. But these actually played a minor role in terms of time and effort for both of the groups.

For a moment, let's examine what *really* happened in January.

Obviously, there were two major meetings held during the same month. At both, experts addressed the critical issues of the day, major announcements were made by major players in the industry, and exotic displays were set-up by the largest businesses in beekeeping.

Think, if you will, of the waste, the duplication of effort and time, and the expense and stupidity of this arrangement. This sort of silliness borders on the absurd and is, in my opinion, down right dumb.

And still, every month these same two groups plead for more money from their members. They both want more support from the government and they both want what's best for their members. Yet every year they rent space in two fancy hotels in two warm cities, have high powered speakers come in with the latest in what's new in research, business or how-to, and plan banquets and tours and other ways to entertain themselves when they're not sitting in a session.

Let me offer a suggestion or two that makes more sense, at least to somebody who considers himself an (almost) unbiased third party. Of course, this isn't the first time this has been pointed out, and, unfortunately, it probably won't be the last, but you gotta keep trying, right?

First, let's have only one meeting, please. Just think of the advantages.

The USDA and University researchers who are asked to tell all in what's new will only have to make one trip. Neither group pays their speakers you know, and you and I are covering these government trips with tax dollars (federal money that could be going to research). So, Bill Wilson, or Anita Collins could give two, three or four talks to the entire group in a couple of days, reach the same, or greater, number of people, and spend only half the travel money.

This goes for the rest of the speakers that do double time, too. The Honey Board doesn't have an unlimited travel budget, nor do regulatory agents or private business speakers.

And speaking of business, both meetings are experiencing a growing number of exhibits each year. Attending two meetings costs money and to make it back they must sell more product or charge higher prices. However, businesses that save money pass those savings along to the customer.

Finally, with a somewhat larger group attending a single meeting, and with a little planning, the costs per person could be reduced. This would undoubtedly induce more people to attend, which would in turn lower costs even more.

I know this won't happen right away, because the 1992 meetings are being planned even as you read this. But 1993 could be the year — and here's how.

The ABF and AHP could select an unbiased third party to spearhead this event. Then, a (small) steering committee composed of members of each group would pick topics the combined session should cover and offer suggestions re-

Continued on Page 109

MAILBOX

■ Bees In China

We are very glad to know that you are publishing a very good magazine related to apiculture.

Our magazine, ***Journal of Bee*** is published by Yunnan Agriculture Academy of Sciences of the P.R.China. The main content of this magazine includes: bee management, the research and utility of bee products, prevention and treatment of bee disease and so on. It has been warmly welcomed by Chinese beekeepers, and attention has come from bee researchers around the world. Last year, we received an invitation from the Asia Publishing Committee to take part in a publishing congress held in Singapore.

For more information about our Journal (published in Chinese) contact ***Journal of Bee***, West Dong feng Road 26, Kumming Yunnan Province, People's Republic of China.

Tanken
People's Republic of China

■ Kid Power

Over the past few years, I have heard many voices of alarm over the future of beekeeping. Forget the Africanized bee and various mites — our biggest problem seems to be a lack of young people entering the profession.

Let's face it — practical considerations wouldn't sell anybody. Small scale agriculture is a rarity and few people get rich in beekeeping. Lots of hard work for little cash return — hardly an appealing picture for today's crop for practical students.

I don't believe that we can just inform young people about beekeeping — the practical considerations are simply not enough. We must inspire young people to help continue this valuable profession. I further submit that the way to do this is to have a "Youth education coordinator" at the state or national level who would design programs to be used in the schools.

Some of these activities might include installing observation hives, establishing a speaker's bureau to include not only beekeepers but also storytellers and folklorists, and coordinating field trips.

Direct involvement and experience for kids would be most effective. Perhaps they might participate in supporting developmental beekeeping projects in other parts of the world (IAAD, for example, helped support efforts of an African Girl Scout troop to establish a village beekeeping industry). Kids could raise funds, gather information and equipment and correspond with foreign beekeepers. Perhaps they might also help establish pilot projects in rural American communities, thereby gaining valuable experience in marketing, community redevelopment and sustainable agriculture. Beekeeping is ideal for such projects — it does not take a tremendous amount of capital or equipment to get started.

Perhaps the beekeeping magazines might consider establishing a "youth page" targeted to younger beekeepers. And beekeeping organizations might include workshops for young people at their conventions.

The future of beekeeping is too crucial to be left to chance. We need young, enthusiastic beekeepers coming up through the ranks, and, I think, we need an organized program to attract these young people to enter the field.

Pamela Spence-Allen
Ostrander, OH

Ms. Spence-Allen is the Coordinator of the American Mead Association.

■ Sweet Smoke

I have found a super smoker material. I have been a hobby beekeeper for 60 years and, like a lot of other beekeepers have tried all kinds of stuff for fuel. Some make the bees mad, while others seem to soothe them.

Here is my material. First I save the fine paper that comes between the foundation and stuff a hand full in the bottom of the smoker. Then I use 1" or 2" pieces of cut up chunks of milk cartons that have wax on them. I dry the pieces ahead of time. We have 4 large pine trees here so I gather the pine cones in fall and put them in the cellar to dry. They burn slowly and don't go out and last a long time. The bees seem to like the smoke as they are easy to work with and I notice you can save that in the smoker to burn again. Any kind of dry pine cones will do.

Thank you all. I love *Gleanings*.

Mr. O. Nightengale
Salem, OH

Continued on Page 71

NEXT MONTH

Most of us won't be marching next month, but rather running full tilt, and in that spirit we've got some fantastic How-To's next month!

We start with the best way to make frames, which always end up as good comb when done right. The cost is small, and when done right will last you years — certainly a good investment.

Then, you can put those frames in the nucs we'll be building. The first of two parts, this piece will get you going if you're in the queen business, or are selling nucs this spring. Good advice from an experienced professional whose primary credential is success.

Next — Good Neighbors almost always use a fence of some type, and if you're an urban beekeeper you need a screen that both looks good and works well. Get some good landscaping/beekeeping and construction advice right here, next month.

Thoughts On Cell Size, part two is here next month too. Dr. Erickson and his cohorts have some interesting ideas, and some disturbing information on foundation, honey bees and beekeeping. Will the African honey bee, varroa and other diseases be affected by something as simple as foundation.

Finally, we've another letter from out friend the 'Old Timer'. Next month he relates a tale of moving bees that'll make your hair stand on end. The perfect example of 'Murphy's Law'.

All of this plus our regulars, like the Mailbox, Inner Cover, Research Review, Bee Talk, The Globe and the Bottom Board. And, as always, there's a few surprises waiting — Next Month!

Reader Assistance

To subscribe, simply fill in the form below and enjoy the exciting features awaiting you this year — Insurance Regulations, Smoker How-To, Requeening Tips, Inspections, Feeding, Pesticide Protection, and Wintering. It's all here — every month!

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- 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.

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MAILBOX

■ Thanks...

I loved your October issue — from the nicely designed cover showing what's inside with my favorite beekeeping image — all those heads lined up along the frame tops to see what's going on — through the significant article on IPM, and the all too short histories by Hofmann, etc. His family letterhead was evidence of the wonderful spirit of optimism that farmers and beekeepers have, or better have.

Mrs. Dawson
Mill Valley, CA

■ Bee Bee Trees

Regarding the request for information about Bee Bee trees in December *Gleanings*. About five years ago I started about a dozen trees from seed.

They have done very poorly. Some have died. I think the problem has been winter kill. We have temperatures down to 0°F and even a little below. I have one that is doing better than the others. It gets a little water from a spring. Part of the problem might be lack of moisture. We have hot dry summers some years. The best one has not yet bloomed.

Loren Davis
Dacatur, AR

Bee Bee trees are available from Forest Farm Nursery, 990 Tetheraw Rd., Williams, OR 97544.

As stated in the Nov. 1955 *Bee Culture*, these trees are very fast growers. I have two that are 3 years old and about 20 feet high. Perhaps they will bloom next year. The catalog states they are hardy to Zone 6.

James I. McCaskill
St. Louis, MO

I saw the request in the December issue of *Bee Culture* concerning Bee Bee Trees. This is a copy of the letter which I sent her along with some seeds.

I have nine trees from 15 to 25 years of age. The blossoms open about the 20th of July here in Southern PA and last about 3 weeks. I don't have enough trees to make a crop of honey, however, it is unbelievable the way bees work the blossoms. They begin at daylight and don't quit until dark, even on rainy and cool days. They work like they do when the are robbing.

The trees are of medium size and beautiful shape. Of my nine trees all bloom profusely and are worked by the bees, however, only one is a female, which produces seed. In 1986 I had a gallon of seed from this one tree which was sent to different individuals over the country. I never heard how many of them grew. There are many seedlings coming under my female tree.

Seeds take 6 to 8 weeks to germinate. The trees grow fairly rapidly and I have heard of it being winter hardy into the New England states.

I certainly would like to see the beekeeping industry promoting the propagation and planting of this important bee pasture.

Max W. Griffic
Newville, PA

■ Bee Board

I have been interested and employed in the field of electronics for years, and while looking for something different to do for fun, I got involved in

Continued on Page 73

MAILBOX

beekeeping last spring and recently subscribed to your magazine. I would like to extend an invitation to the readers of *Gleanings in Bee Culture* to call my computer bulletin board service at (502) 267-7422. Topics of discussion include apiculture, amateur radio, computers and general science. There is also a debate section dealing with all topics. No fee for use (long distance calling changes still apply for non-Louisville area callers). And please, keep it clean.

Dennis K. Deckmann
Jeffersontown, KY

■ Cover Comment

I really like the pictures on your front cover. You can understand the old saying "one picture says a thousands words."

I would like to be able to buy copies of the pictures used on your covers. I value my copy too much to cut them off and use in my talks. Your October issue made me smile because that is how I describe how "cute" bees are — all looking up at you. People have a hard time visualizing bees as cute!

Keep up the excellent work.

Sheri Kisch
Laurel, MT

We don't make copies of our covers usually because the photo is copyrighted by the artist. However, occasionally we could make reproductions, but we need to make a fairly large number to sell them for a reasonable price. However, our subscription people tell me that for $1.95 you can get an extra copy, (providing there are some) which includes postage.

The Editor

■ Less Is More

I have been reading *Bee Culture* for several years and love it, however I have been disappointed at the amount of space given to the mites and A.H.B.'s. Since most of your subscribers are hobby beekeepers like myself I find the technical articles on mites and AHB tiresome. Yes, I want to keep up with them but in more condensed and factual form.

Loren Davis
Decatur, AR

■ Donates Photos

I was glad to see you used my snapshot to illustrate an article. You can't get any better pictures than mine. I am very conceited about that. I spent a lot of time and money taking them.

The December *Bee Culture* has a classy look with that fine white paper. Aristocratic — a joy to read. It deserves respect.

Charlie Koover
Honolulu, HI

During the many years Charlie Koover was writing for *Bee Culture* and the *British Bee Journal* he took literally thousands of photos to illustrate his writing. He's right about the quality — they are excellent. Further, they are, for the most part, timeless and will not go out of style.

Mr. Koover recently sent us his entire collection of photos and negatives. We are still sorting through the

Continued on Page 74

MAILBOX

boxes he sent and I'm sure will be using them for years to come.

Charlie, your generosity is appreciated — not only by us, but the people we both work for our readers. Thank you.

The Editor

■ Recipes?

I am looking for recipes or formulas for cosmetic creams, powders or liquids using honey products such as beeswax, pollen, royal jelly, honey, propolis.

Please send any information or book sources to :

Garrick Kruse
Life Force Honey Co.
1193 Saddleridge Rd.
Moscow, ID 83843

■ Russian Beekeepers

Recently I became acquainted with two young men, Alex Kaziez and his cousin, Yakov, beekeepers who have emigrated to the United States from the Kazak SSR in the Soviet Union. They are now searching for several things, the first being a Russian beekeeper so that communication is simpler, and they can learn about beekeeping in the Untied States.

The second item is location. They wish to set up an apiary somewhere near as practical to New York City and need assistance in finding a place.

Any help would be appreciated and can be routed through me. Thank you.

Leo R. Kawecki
91-15 193 St.
Jamaica, NY 11423

■ Calendar Confusion

Regarding the Dec. Inner Cover, you stated that another decade slips away. That is not so. The decade ends Dec. 31, 1990. The counting system is 1 to 10, not 0 to 9. 1981 was the 1st year of the decade, and so on until 1990 which is the tenth year. The other way 1980 would not be the 1st year of the decade but the last year.

Also the last year of this century is the year 2000. The first year of the 21st century is 2001.

A lot of people don't realize it, but that is the correct way.

I won a trivia contest on when a decade and a century ended.

But I still enjoy the magazine.

Harold Cory

Technically you're correct, but going from '89 to '90 is so much more dramatic than from '90 to '91. Too, when referring to chunks of years conventional wisdom suggests the 80's are 1980-1989, not 1981-1990.

Either way, Happy New Year.

The Editor

■ All Right!

From The Editor —

A few months ago I penned a somewhat tongue-in-cheek piece regarding honey bees, beekeeping and animal rights. The source was legitimate — a group of people are concerned about the rights of honey bees. They also are concerned about the rights of fox, mink, cows, chickens and the rest.

My point was that they did not have a good understanding of beekeeping, and were making policy decisions on false or misleading assumptions.

A reader took exception to my levity, and expressed his beliefs regarding animal rights, but focused primarily on the fur industry. As you might imagine, several readers took exception to that letter too, which is getting us further and further from beekeeping.

However, like the mail on the show "60 Minutes", I'll print excerpts of some of the reactions to the dialog to date:

From John Boruff, Henderson, IA

"... Predation has been an important population control measure in nature forever. Since man has crowded out the large carnivores, it falls on him to take their place. Without the effect of hunting and trapping, the "balance" would be instead a pendulum swing, with booming populations on one end and widespread death by slow starvation and disease on the other. To allow or condone this prolonged suffering and waste seems the true crime to me. ... I agree that no one has the right to inflict torture or extinction on anything. But suffering and death has been and will always be with us no matter who or what is responsible. The crime is not the killing of individuals, but the destruction of habitat. To blame trapping for extinction is a misrepresentation of the facts.. ... If prime habitat is sacrificed in favor of a shopping mall, it wouldn't matter if no trapping were allowed at all, wildlife will soon be gone.

MAILBOX

... *Gleanings* is wise to be concerned about the attitudes of "animal rights" people concerning beekeeping. The fact they would consider it cruel in any way should clearly show their inability to differentiate between true cruelty and normal animal usage. ..."

Then from Gary Becker, Aspers, PA:

"... Does Mr. Alt eat meat, use leather, eat fish? Does he 'rob' any honey from the bees? Or does he eat only vegetables? If so how does he kill the vegetable? ... Does he drive an automobile? Has he ever injured an animal with it? Has he gathered a butterfly or moth in his grill? Or even worse a honey bee! ... It's a great shame that the animal rightists (sic) are wasting so many millions of dollars fighting animal use. This would be better used to purchase land (habitat) where *wise use* of our wildlife resource would benefit both consumptive and non-consumptive users. ..."

Finally, from Ron Rosenlund, Worcester, MA:

" ... Fur is a renewable natural resource unlike manmade fibers which are derived from oil or oil based products. Oil is not a renewable natural resource and when we waste it all it's gone and for good. Fur is warm, luxurious, extremely durable. ... The animal wrongists (sic) would leave all the animals to propagate unregulated causing overpopulation, depravation of crops, property damage, damage to domesticated animals, disease, starvation, disease to humans, ... etc. ... etc. ... all at the hands of mother nature who can be crueler and more inhumane than any person. ... I for one am extremely proud to be a trapper, fur farmer, beekeeper and an amateur ecologist/conservationist. ..."

So, until we hear more, let's let animals rights, beekeepers and beekeeping be.

The Editor

BOOK REVIEW

Nectar and Pollen Plants of Oregon and the Pacific Northwest

Over 250 plants useful to bees in the Pacific Northwest are included in a new 160 page book by Mike Burgett, Bertie Stringer and plant taxonomist La Rea Johnston.

This illustrated dictionary of plants used by honey bees is a valuable reference for beekeepers, gardeners, naturalists, and anyone who is interested in the nectar and pollen producing flora of the Pacific Northwest. Hummingbirds, butterflies, bumblebees and other insects may also be attracted to, and benefit from, many of the plants described in this book.

Each of the concise, illustrated entries includes the plant's common and botanical names, plant family, growth habit, bloom period, flower color(s), nectar and/or pollen production, distribution and remarks. Flowers are also listed by color in a separate table. The extensive bibliography contains many useful references for those requiring more specific identification of plants or additional reading. The comprehensive index, containing common and scientific names, makes all listings easy to find in the text.

While the book focuses primarily on Oregon plants, the authors explain that "state lines do not dictate botanical boundaries, and the influence of this work extends far beyond the state of Oregon into other regions of the Pacific Northwest"

Nectar and Pollen Plants of Oregon and the Pacific Northwest is the only fully illustrated regional handbook of bee plants, and is an essential reference for anyone curious about the nectar and pollen producing plants of this area.

Copies of the book may be obtained for $11.95, postage paid, from Honeystone Press, P.O. Box 511, Blodgett, Oregon 97326. □

Berti Stringer is a regular contributor to *Gleanings in Bee Culture*, most commonly noted for her **Beauty and the Bees** column, but also for several other articles covering a variety of topics.

FEBRUARY Honey Report

February 1, 1990

REPORT FEATURES SUMMARY: R=Range of all prices; A=Average prices across all regions; LM=Last month's average; and LY=Prices one year ago. Comments: Price Index is a ranking system comparing a region's prices to other regions.

	Reporting Regions								Summary		History	
	1	2	3	4	5	6	7	8	R	A	LM	LY
Extracted honey sold bulk to Packers orProcessors												
Wholesale Extracted												
60# White	43.50	39.40	30.00	37.20	42.00	36.50	40.10	40.75	30.00-44.00	39.16	37.27	38.62
60# Amber	42.50	33.68	28.70	31.20	36.00	34.50	36.00	42.00	28.70-50.00	36.44	34.37	35.75
55 gal. White	.51	.37	.50	.50	.40	.55	.55	.59	.30-.65	.50	.53	.52
55 gal. Amber	.50	.37	.44	.45	.37	.50	.51	.47	.27-.52	.46	.48	.47
Case lots — Wholesale												
1#, 24's	28.80	28.36	24.10	23.77	24.70	24.00	27.50	29.48	20.40-38.40	26.70	26.88	26.15
2#, 12's	27.40	23.83	24.80	22.63	20.40	24.11	26.50	28.28	20.40-29.00	24.60	25.94	26.42
5#, 6's	30.95	24.25	22.70	24.86	25.93	25.17	27.50	26.10	18.60-31.00	25.82	26.83	26.26
Retail Honey Prices												
1/2#	.97	1.05	.89	1.08	.98	1.00	.98	.94	.83-1.50	1.00	.94	.94
12 oz. Plastic	1.60	1.50	1.21	1.24	.98	1.21	1.35	1.39	.87-1.89	1.34	1.31	1.34
1#	1.72	1.63	1.49	1.55	1.41	1.49	1.60	1.59	1.29-2.00	1.58	1.55	1.56
2#	3.20	2.96	2.71	2.93	2.40	3.00	2.95	2.62	2.10-4.00	2.87	2.70	2.81
2-1/2#	3.50	3.79	3.29	3.59	3.51	3.33	3.59	—	3.29-4.98	3.63	3.32	3.53
3#	4.20	4.15	3.90	3.69	3.24	3.75	3.80	3.55	2.79-4.50	3.79	3.82	3.78
4#	5.50	5.17	4.75	4.79	4.95	4.50	4.85	—	4.50-5.50	4.96	4.90	4.75
5#	7.13	5.98	5.49	6.35	4.99	5.29	6.10	5.99	5.29-7.50	6.08	5.80	5.76
1# Creamed	2.13	1.00	1.45	1.57	1.59	1.59	1.80	1.65	1.00-2.25	1.65	1.64	1.65
1# Comb	2.67	1.88	2.69	2.99	2.35	2.00	—	2.25	1.85-2.98	2.38	2.33	2.20
Round Plastic	2.12	2.50	1.95	1.85	1.95	1.79	1.99	1.75	1.75-2.25	2.00	1.90	1.81
Wax (Light)	1.15	1.10	1.05	1.15	.95	.95	1.00	1.20	.95-1.20	1.08	1.09	1.00
Wax (Dark)	1.05	1.00	.90	1.05	.85	.90	.90	1.10	.85-1.10	.98	.97	.87
Poll. Fee/Colony	30.50	—	—	28.75	—	—	—	29.50	27.00-32.00	29.58	25.50	25.16

MARKET SHARE

The U.S. and the world honey markets have nearly reached an equilibrium this year: Supply equals demand. This has caused prices, especially at large packer's docks, to rise above buyback. Prices will undoubtedly go higher. Home and small scale sellers MUST have their prices reflect the U.S. supply. Even the generic brands in chain stores will increase prices soon. Don't be caught short.

Region 1

Price Index 1.00. Prices up a bit, still doing well for holiday and seasonal sales. Demand steady or increasing as cold weather grips area. Shortages not quite as apparent in this region as good crops were the rule.

Region 2

Price Index .70. Sales steady to a bit slower but demand still strong. However, prices not reflecting either. Suspected reason is localized reporting rather than over all picture. Reports of cold weather and high mite population causing concern.

Region 3

Price Index .77. Sales and demand steady with prices steady. However, they will be rising soon due to extreme shortages and even more so with the December freeze.

Region 4

Price Index .82. Prices steady and sales increasing. Seasonal demand is good. The market is healthy but much concern over the health of bees. Varroa, tracheal, extreme cold, poor fall flows all add up to early feeding and some lost colonies.

Region 5

Price Index .85. Sales steady to slow, demand a bit below normal for season but not much. Weather has been cold and spring feeding will be required in most areas.

Region 6

Price Index .83. Sales and prices down a bit for season. Demand just starting to pick up for cold season. Shortages in some areas will drive prices way up soon.

Region 7

Price Index .90. Prices and sales steady, demand strong and getting stronger. Expect prices to increase even more. Dry in some parts will mean plant damage and perhaps shortages next spring.

Region 8

Price Index .91. Prices steady to increasing, demand and sales excellent in most areas. North sales strong, especially in holiday sales. Southern areas experiencing dry conditions yet. Pollination contracts getting busy, especially almonds.

Interested in becoming a "Honey Reporter"? Contact the Editor today!

RESEARCH REVIEW

DR. ROGER A. MORSE

Cornell University • Ithaca, NY 14853

"African bees have some limitations after all."

The coming of the African honey bees into Texas, probably this year, raises many questions. A discussion of what has happened since they have been found in Peru appeared recently and gives us a bit more information. Peru lies on the western side of South America. Its area is about twice that of Texas but it is a long country that stretches about 1400 miles along its Pacific Coast. The Andes Mountains run lengthwise through the country and separate it into two parts. There is more land on the eastern side than the west. Peru is bounded on the north by Ecuador and Columbia, the east by Brazil and Bolivia and the south by Chile.

Africanized bees were first found in eastern Peru in about 1974. By 1978 the bees were firmly established on the eastern side of the Andes Mountains at elevations below about a mile; apparently they have not moved into the higher elevations. In 1978 or 1979 migratory beekeepers carried the bees over the Andes and into the west coast area.

A survey of beekeepers asking them about beekeeping problems was taken 1981 and 1982 but the results were published only in 1989. Interestingly, Africanized bees were not of the greatest concern. Beekeepers rated their primary problems in the following order: "lack of technical assistance, unfavorable weather, insecticide use, poor honey flora, and inadequate sources of beekeeping supplies and equipment. Secondary problems, each reported by fewer than 10 percent of the respondents, are pests and parasites, lack of credit, African bees, overcrowding of apiaries, disease, and aggressive-

ness." There were several other minor problems cited by a few beekeepers.

Beekeepers said they were wearing more protective clothing than before, requeening more frequently, and moving apiaries to more remote locations. Beekeepers in the Africanized region also reported more changes in ownership of colonies and greater use of modern equipment. Compared to beekeepers using European bees, those in the Africanized area had more experience keeping bees, their per capita yields were greater, and they were better informed and had more contact with each other. "Although this study demonstrated that stinging incidents involving humans and livestock are slightly more common in the African region, statistically these differences are not significant." The author concludes that the Africanized bees are not as disruptive as often portrayed; they are more bothersome but not a major problem. He hopes too that the Peru experience will provide some insight for policy makers in North America, and suggests that instead of spending scarce funds on barriers and the diffusion of hybrids in Mexico and the U.S., money should be used for extension education.

Effect of Elevation on Africanized Bee Temperament

Colonies of Africanized and European honey bees were tested for aggressiveness at two elevations in Colombia, South America. Africanized bees, as expected, were much more aggressive in these tests than their European counterparts. However, the point of this paper is that the Africanized bees were slower to react and stung less at the higher elevations. Even the data collectors were affected by the differences: at the higher elevations an observer could sit in the open and watch the activity of the bees from a relatively short distance, at least 20 meters (over 60 feet) away, while at the lower elevations it was necessary "to hide in the fence row"

The different temperatures at the two sites were probably the critical factors, although the author hastens to point out that "the results could lend themselves to hasty conclusions," and that a higher elevation influences many environmental factors other than temperature. Nevertheless, these data support previous reports that Africanized bees tend to be more aggressive in warmer climates than in cooler ones.

The Sex of Varroa Young

For some years we have thought that the first egg laid by a varroa mite develops into a female but this is apparently not true. New information shows that the first egg develops into a male and subsequent eggs are females. This information means that previous calculations of varroa development time (and population growth rate) must be revised. The development time for a male is 6.9 days and a female 6.2 days. One egg is produced about every 24 hours by an egg-laying female. On German bees (in Germany) an adult varroa female can produce up to three adult females per reproduction cycle.

We are aware from earlier research by others that the varroa population grows faster in European bees than in Africanized bees in South America. The Africanized bees have a shorter development time and few problems with varroa. In fact, though we find varroa in every colony of Africanized honey bees in Brazil where we search for it, no Brazilian beekeeper treats for the mite or is concerned about it. Apparently, the shorter development time for African worker honey bees means fewer varroa mites have time to mature. □

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An Overview of Queen Rearing

STEVE TABER of Honey Bee Genetics

P. O. Box 1672 • Vacaville, CA 95688

"Try raising some queens this year. It's easy, fun and inexpensive."

Every beekeeper should learn how to rear queens. It is fun, useful and relatively easy. And though many, many books and articles have been written about queen rearing, it is not a mysterious or complicated task.

But there is something mysterious about why bees will sometimes rear good queens, sometimes poor queens and even queen-worker intermediates. You can, however, expect to raise good queens if you adhere to a few basic principles. Here they are:

First, select the best breeder queen you can find. It's the one that headed up the best colony you had last year, and the same one that made it through the winter in *great* shape. There's both circumstantial and experimental evidence to support the belief that mite infested colonies don't make it through the winter in good shape. So if your colony made it, it either didn't have mites, or is showing at least some resistance to them.

Next, in the colony or nuc you will use, be sure there are combs of open honey and pollen in very close proximity to the queen cells you will raise. This is easy to do. Either put frames of honey in, or, feed sugar syrup and the bees will put it where it belongs. If the bees don't already have combs of stored pollen to put next to the queen cells, you can make some by dribbling pollen pellets into open cells and then wetting them with a mister. The bees will pack them right in.

Third, queens can't mate unless and until there are lots of drones. Sure, you can raise queens, but they have to have drones to mate with. Feeding pollen as early as possible will help here, because it will start your breeder queen laying earlier. No drones — no mating!

Finally, look at your queen. The only thing we really have to go on now is size. Look at her head, thorax and abdomen, you want all of them big. Yes, I have heard the argument about some small queens that performed well over several years, but I have also seen large queens out perform small queens every time. So your first principle is to look at queens and make a judgement decision as to whether she is big enough. That's all there is to it — you can raise good queens.

But what method to use? This may disappoint you, but it doesn't make any difference, because one method isn't any better than another. And there are probably none which are any worse than the rest either. Select a method that for you will be inexpensive. If you need just a few queens, say up to 50, use the Miller method. If you want more than 50 queens, it will be easier if you learn to graft the little larvae, as I do.

THE MILLER METHOD

I have never really done this but I can see that it should turn out from 10 to 30 perfect queen cells every time. I had one guy tell me that it didn't work, but after a lot of questioning I found out he had been trying to do this during a honey flow. Rather paradoxically, I have found that it is very difficult to raise good queens during a good honey flow. What you have to do is turn the honey flow off, which is easy as pie. Remember, the bees rearing the queen cells are not those flying out gathering nectar and pollen, so pick up the hive and move it 10 or 15 feet and place a dummy in its place with a frame of brood to hold the returning bees. All the flying bees will go there and leave the queen rearing bees alone to do their job.

Another point to remember is that it doesn't take tremendous colony population to raise good queens. I always figure 250 bees *of the right age, for each queen cell*. The right age is 10 days old.

To do this, fix a frame with 'V' shaped pieces of foundation hanging from the top bar. Place the frame in the middle of the brood nest of your breeder colony. Be sure the bees are crowded and need room. Come back in four to 10 days and see what's happened to the mostly empty frame. The bees should have begun building comb on the existing foundation, the queen should have started laying in that, and the bees should have continued building more comb.

What happens, as the comb is built, is that the queen will lay first on the comb over the existing foundation, then in the comb that was added to the bottom of the foundation. The bottom of the new comb should contain only eggs. When you look up toward the top bar the larvae should be progressively larger. With a sharp knife, cut off all the parts of the new comb containing only eggs, leaving behind the parts of the comb containing just hatched eggs. Then remove the queen and place her in a nuc; or some place suitable for royalty.

After the queen is removed and the frame returned to the original colony, the bees will begin raising new queens. All queen cells will be built along the bottom edges of the new kind of 'V' shaped comb, and there will be a nice bunch of them, perhaps as many as 20. Write down the date you removed the queen and remember that 10 days later the queen cells must be removed and

placed into queenless nucs to emerge and mate.

Make up these nucs with bees, a frame of brood and a frame of honey and an entrance big enough to let two bees pass. The mature 10 day old cells are cut out with a sharp knife and carefully pushed into the middle of the brood comb. The queen should emerge in the next two days and mate five or six days later, and begin egg laying two weeks after the cell was placed in the nuc.

After you've removed the queen cells from the original colony, go through it carefully and make sure there are no other queen cells. Then reintroduce the breeder queen to her colony. In a week or so you can repeat the procedure getting an additional batch of queen cells.

GRAFTING

The term means transferring just hatched larvae from a worker cell where they were laid, to a queen cup. This technique was developed about a hundred years ago and is a suitable technique for raising thousands of queens from a selected breeder. All you need are enough bees of the right age — 250 bees that are 10 days old — for each queen cell.

Newly grafted cells should be placed in a colony of queenless bees that have honey and pollen, and if confined, water, for about 24 hours. They can then be left with the queenless bees that started them or placed above an excluder of a queen-right colony.

The procedure I use is to graft every Tuesday. I take the bees above the excluder of a colony, and shake them into a confined box so they will start the cells. Then when the cells, bees and combs are placed back into the colony, the eight day old cells are removed and placed in an incubator where they emerge in 11, 12 or 13 days.

Obviously there's a lot more to this than the very short description I've just given. But, as you can see, raising queens is not a mysterious enterprise. And, there are hundreds of books and articles explaining how to do it.

Whichever method you use, you'll make some mistakes at first, but you'll get better, and it's fun. □

AVOIDING VARROA

Peter Witherell

The varroa mite has been an unwelcome guest in the U.S. since 1987, and indications are that it won't go away. Originally living in only the Far East, it is now on every continent where bees are kept except Australia.

Because this mite will probably never be completely eradicated, those who have it must either find effective ways to minimize its damage and spread, or risk going out of business. Countries and states still uninfested should strive to remain so for as long as possible.

Fortunately there are a few things every beekeeper can do to minimize the risk of introducing and disseminating varroa. Once you understand the various means by which varroa mites get into and spread around your apiary you can take prudent and appropriate preventive measures. More importantly, most of the principles discussed apply equally well to tracheal mites and other bee diseases. Forewarned is forearmed!

Questionable Sources

Catching stray swarms or transferring feral colonies from trees into your equipment are both ways to increase your number of colonies. However, if you live in an area where varroa mites have been found, then these bees are certainly risky. Even if their original apiary is known to be free of varroa, there is always the risk that a clean swarm may have merged with a varroa-infested swarm before discovery. Buying established colonies, shook swarms, or nucs from other beekeepers also comes with certain risks, as does the purchase of packaged bees or queens. The seller should always provide certification by the appropriate state agency, testifying that the bees were inspected and found to be free of varroa. As an added precaution, caged queens can be shipped with an Apistan® Queen Tab inside the cage, though absolute protection from varroa cannot be guaranteed by this procedure.

Make sure your package supplier has been checked out by their state's inspectors and if there is some question, ask about queen and package treatments.

Self Inflicted

Beekeepers often equalize the strength of their hives by shaking excess bees or transferring frames of brood from strong hives to help their weaker sisters. This is all well and good, as long as the donor hive has no varroa. If it does, then you are simply aiding in its spread. Even exchanging empty equipment (such as supers) can be hazardous, because varroa mites can survive away from their bee hosts for periods of *up to seven days*.

Once an apiary is infested with varroa, a hobbyist beekeeper can retard further spread by ***not*** exchanging equipment or frames of bees among different hives. A commercial operator, on the other hand, must treat each apiary as a unit, mixing bees or equipment only *within* apiaries but not *between* apiaries.

Rarely, a beekeeper's clothing and tools, to which varroa may cling, may transmit mites from one hive to another during routine hive manipulations. Probably not a great threat in the case of varroa, it can be minimized by simply taking the time to brush off after inspecting each hive to dislodge any loose mites or (more likely) any varroa-infested bees passively clinging to a veil or coveralls.

Communal Feeders

It is common practice in some apiaries to feed bees sugar syrup in an open-type feeder or trough, or to have the bees clean up supers of extracted (wet) combs by placing them out in the open. When this is done, bees may display behavior similar to robbing. Occupants from different hives can be seen fighting with one another, as if defending their source of food. Because these bees come into close contact with each other, open feeders and wet combs are conducive to spreading varroa. The same may be true of crowded watering sties.

A safer feeding method is where feed is placed *directly inside the hive*, such as inverted buckets of syrup over the inner cover, or division-board feeders. If extracted (wet) combs are fed make sure robbing bees are denied access to the feed.

Location

Feral colonies are notorious as reservoirs of diseases and mites, including varroa. Before locating an apiary at a new site, attempt to eliminate all potential sources of varroa. Other colonies in the area should also be considered. Are the bees already in the area infested? If so, locate your apiary well out of normal flying distance of the infested apiary. A good buffer is at least five miles. This has always been good practice from the standpoint of overcrowding an area with limited nectar or pollen resources, but now, more than ever, this is also important from the standpoint of avoiding varroa.

Queen mating is another issue to consider. Virgin queens may fly several miles during a nuptial flight. Drones may do the same, flying along established pathways to drone congregation areas, where the actual mating takes place. It is well known that drones, at least at emergence, are more likely to be infested with varroa mites than workers, and queens typically mate with a dozen or more drones, usually from several colonies. It is possible, even likely, that varroa mites could transfer from drones to a queen during mating. Evidence for this is, so far, mostly anecdotal, however.

In the meantime, queen breeders should strive to assure queen mating nucs, drone production colonies, and even their neighbors' colonies are varroa-free. Also, using Apistan® Queen Tabs in queen-mailing cages will help.

Drifting

Bees generally return to their own hives, but if they become disoriented they may stray into a neighboring hive. Also, they may fly from a passing truckload of hives, or their original colony may have been moved and returning foragers will go to the nearest colony. To prevent drifting move bees at night and/or use a net over the load of hives being moved.

Drones especially have a tendency to drift into other hives, and are usually welcome wherever they go, particularly during a honeyflow. They also have a higher incidence of varroa infestation, at least during their developmental stages, so they may be a major factor in the spread of varroa. Drifting workers, however, since they are more numerous than drones, are probably more important. To reduce drifting, provide visual orientation cues for the bees (i.e., trees and other landmarks, or variously colored hives), and apiary arrangement (random spacing, entrances facing in different directions, and not placing hives in a straight line).

Varroa mites are mobile themselves, at least to some extent, and are capable of simply walking from one hive to an adjacent one on the same pallet. The extent to which this occurs is unknown, though it is probably not as great as mite transport by drifting bees.

Treat 'Em All

In some states where varroa has not yet been detected, the state apiary inspector has the authority to kill colonies found infested with varroa. In other states, where varroa has become established, the approach has been to treat infested colonies, usually in the form of two Apistan® Strips suspended in the brood chamber between combs, for a period of at least 21 days. This is probably the best *treatment* available at the present time, and is nearly 100% effective when done right.

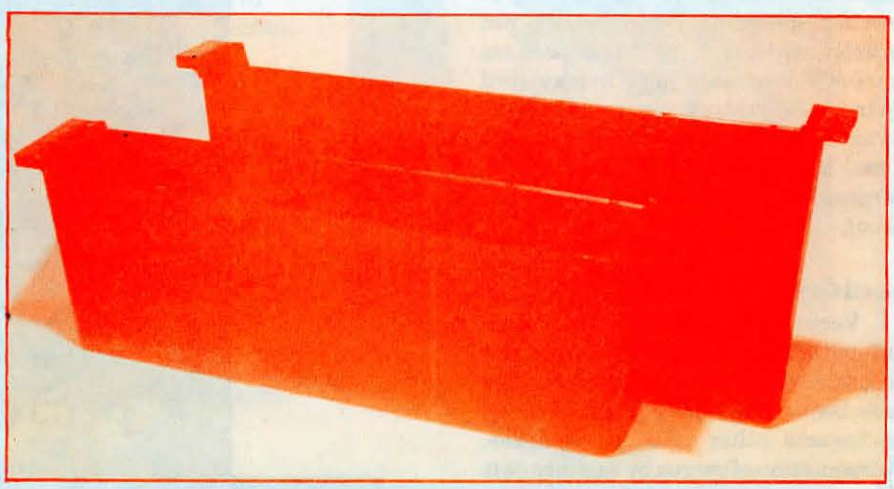
In the future, other chemicals, management schemes and genetically resistant bees will become available. My point, however, is that if *one* colony in the apiary is treated, *all* must be treated, given the likelihood of reinfestation following treatment. Failure to treat all colonies in the apiary at the same time is a mistake, because low-level varroa infestations can easily escape detection, and can build up to disastrous proportions the following year.

Robbing

Varroa mites transfer easily from bee to bee within a hive, where bees come in direct or close contact with one another. This is of little consequence as long as the bees are all from the same hive. However, once robbing starts, mites can easily be transferred from the bees of one hive (or apiary) to the bees of another.

Precautions against robbing include keeping strong colonies, reducing or partially screening hive entrances so that honey is not exposed, opening hives for only brief periods of time (especially in times of nectar dearth), and closing hives whenever bee behavior shows evidence that robbing has begun.

Continued on Next Page



Internal feeders like these, reduce bee to bee contact. Though commercial operations may not have the labor necessary for these, it should be seriously considered to avoid or reduce the spread of varroa.

Leaving a super full of honey exposed, like this, will incite robbing in an entire apiary. Keep honey supers covered when working hives or harvesting.

Migratory Beekeeping

Migratory beekeepers have a right to make a living hauling bees from place to place for honey production, crop pollination, or to find better sites for overwintering. However, like it or not, some migratory beekeepers must bear part of the blame for spreading varroa mites to states that were previously uninfested. Much of this could have been prevented if the colonies being moved had been properly inspected and certified varroa-free, or treated if necessary, before being moved.

There is an inherent conflict of interest, it seems, between non-migratory beekeepers on one hand, and migratory beekeepers and the growers who need pollination services. Non-migratory beekeepers blame the migrators for spreading varroa mites, not entirely without justification because some of the varroa brought in may wind up in non-migratory colonies. As unfortunate as this may be, it is nevertheless a real hazard that non-migratory beekeepers face and can presently do little about.

Incidental Hosts

Vectors are organisms that transmit pathogens or parasites from one host to another. And yes, varroa mites have been occasionally reported found on insects other than honey bees. Transmission of varroa by this means is almost completely beyond your control. The Florida Division of Plant Industry has confirmed records of this mite on a hover fly and a bumble bee. Apparently, flies and bees visiting flowers in the area of varroa-infested bee yards can become infested too. The mites probably do not feed on these insects, though we do not know for certain.

We also don't know if varroa mites can complete their life cycle in the nests of bumble bees; this may be worth investigating, especially since most entomologists now consider bumble bees and honey bees to be in the same family (Apidae).

Dung beetles are often seen in bee hives in Florida and have been reported carrying varroa. In Switzerland, varroa mites have been seen clinging to the bodies of wasps (probably *Vespula* sp.) which often enter colonies and feed on honey or brood. The same wasps may enter different hives, thus spreading the mite.

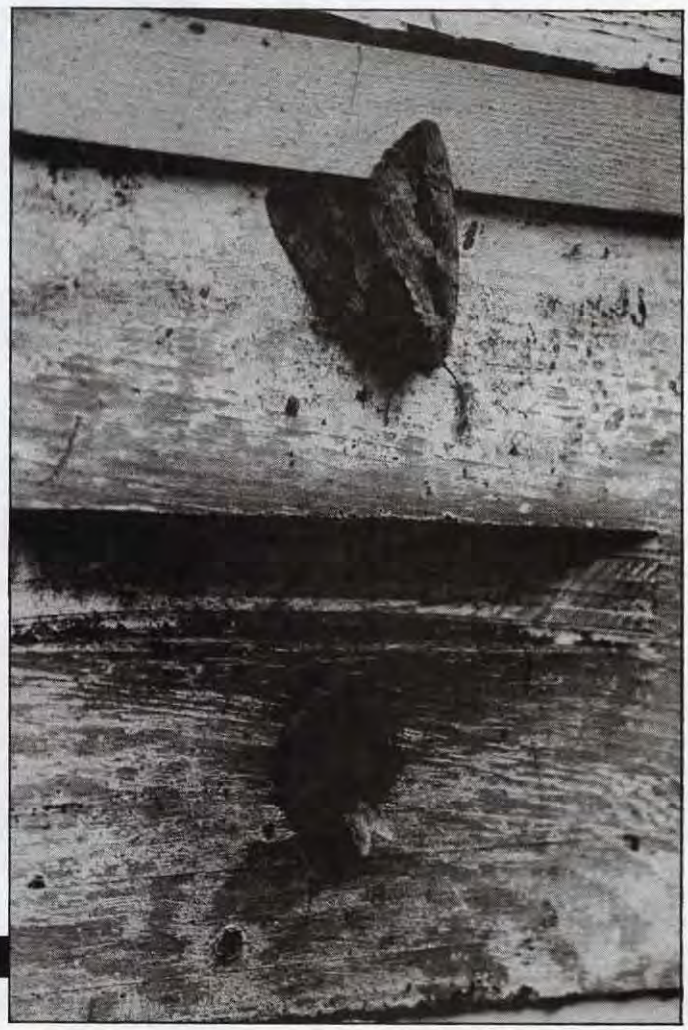
The greater wax moth (*Galleria mellonella*) would also seem to be an ideal vector of varroa, though we have not seen any documented reports of this yet.

Remember that varroa mites can survive for up to a week away from their host bee, *without feeding*. It is possible, even likely, that these mites often become detached from a host bee while visiting a flower. Some varroa may live long enough to find another honey bee on the same flower and be transported back to another colony.

Avoiding varroa is actually easier than you may have thought, and we've only pointed out the most obvious ways to reduce transmission.

Sound management, keen observation and attending to details can significantly reduce your chances of finding varroa in your colonies. Remember, know where your bees come from, don't mix infested and non-infested bees, only feed colonies internally, prevent or reduce drifting and treat or destroy infected colonies when you find them.

Varroa can't be cured — yet, but you can do much to avoid the beast. □



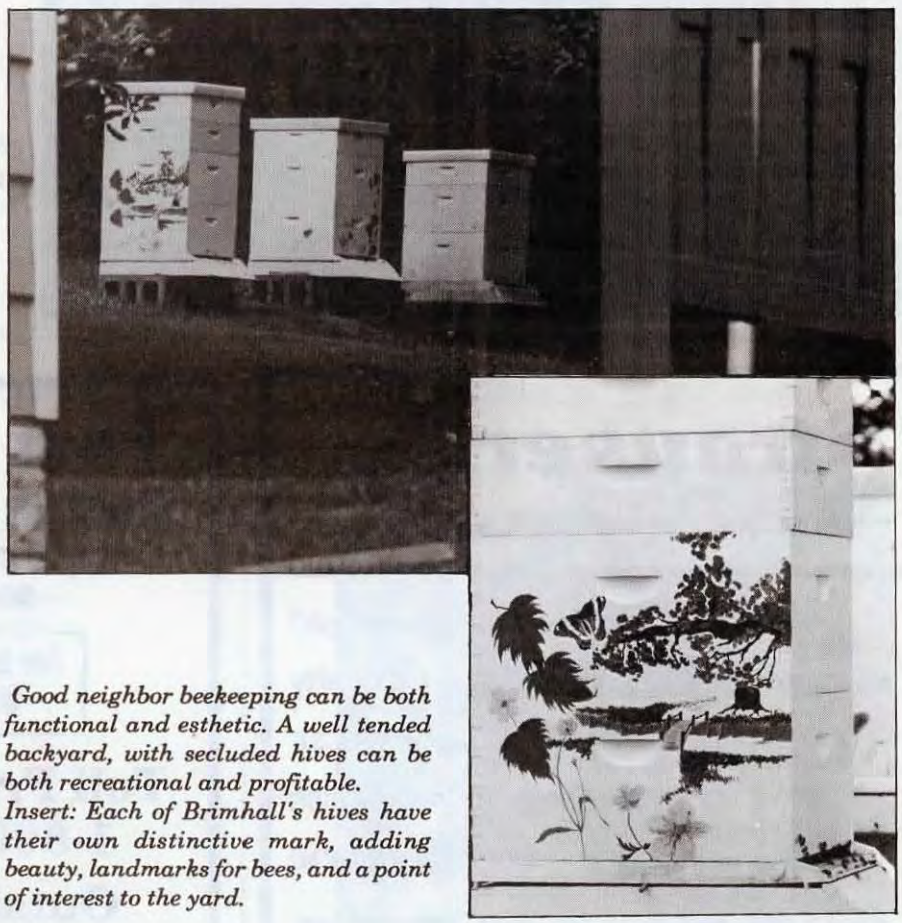
Could this be a varroa vector?

Good Neighbor Beekeeping

James Brimhall is our **Great Good Neighbor this month. The** Brimhall's live at 941 Lee Street, South Albans, WV 25177. James was one of the runner-ups in our contest and his entry, though a bit unorthodox in format, exhibits the spirit needed to be a Great Good Neighbor.

Here is his entry.

The following list indicates the activities in which I have engaged over my 13 years of back yard amateur beekeeping in the midst of a small city:



Good neighbor beekeeping can be both functional and esthetic. A well tended backyard, with secluded hives can be both recreational and profitable.
Insert: Each of Brimhall's hives have their own distinctive mark, adding beauty, landmarks for bees, and a point of interest to the yard.

MANAGEMENT TECHNIQUES

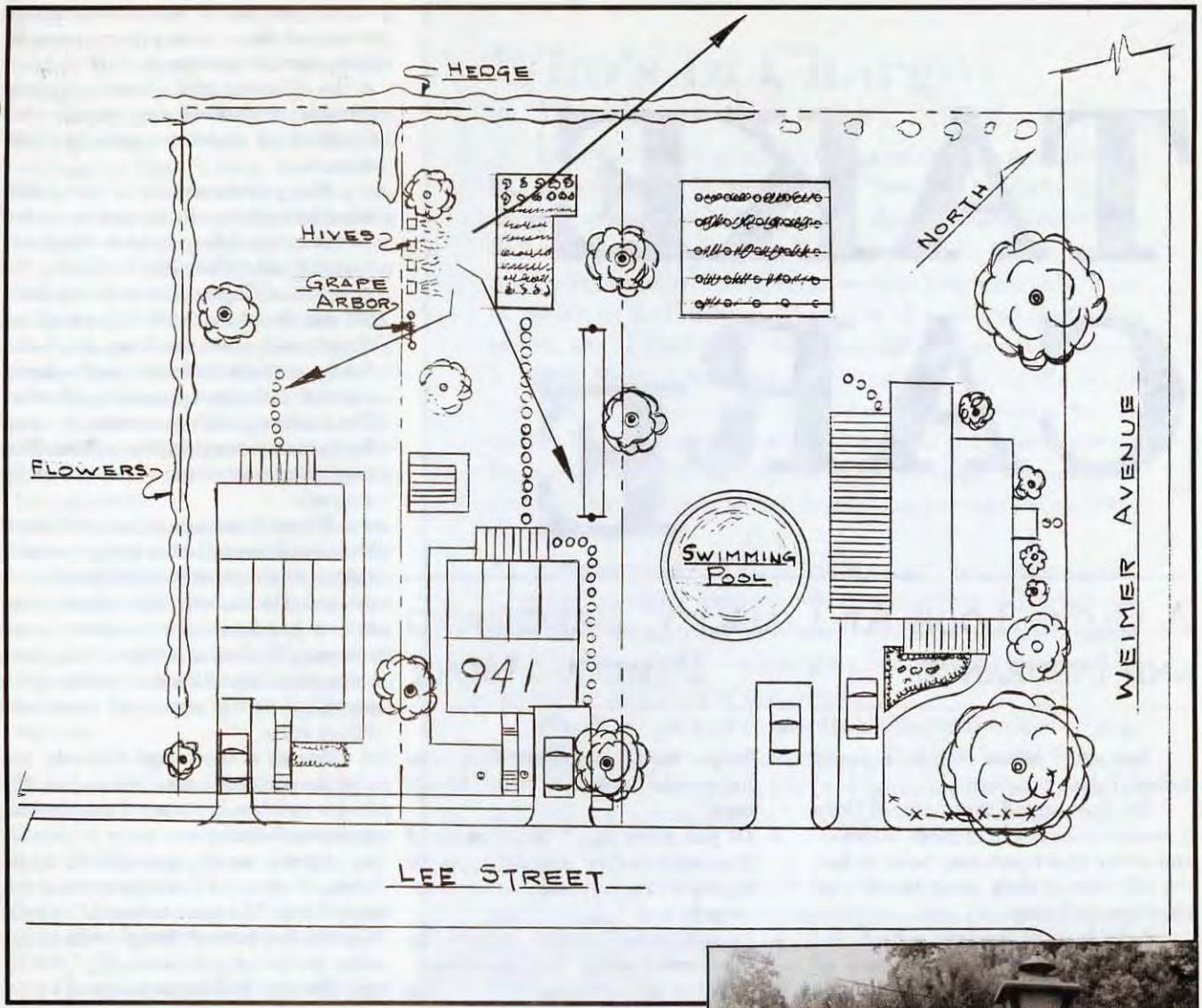
- Hives are faced toward the interior of my yard
- We planted a grape arbor to provide a higher flight path across our neighbor's yard
- Frequent inspections are made to detect any signs of aggressiveness or other problems
- A water bag is supplied in a nearby apple tree to reduce the need for my bees to seek water from swimming pools or other water sources
- I requeen when necessary
- All hives are medicated properly in both spring and fall to keep hives healthy and not stressed

PUBLIC RELATIONS

- My name and telephone number is listed with the local police and fire authorities to be contacted when residents call concerning bee swarms
- Hives are painted non-white and have added designs for variety and discussion
- Feral colonies are removed from the walls of homes when needed
- I generally wear shorts and no veil when collecting swarms in the community to present an image of confidence and calm
- Honey and hand-dipped candles are sold to neighbors or given as gifts and honey is used for allergy problems
- An observation hive is kept in the kitchen window for family and visitors and for demonstrations at local schools
- I work with novice beekeepers, providing assistance when needed

Hives are placed so that entrances, and hence flight paths, are into Brimhall's yard, and eventually over the neighbors. This eliminates problems with outside human activities. The pole structure is a grape arbor, which causes flight activity to go up and over the neighbors yard

Another view, showing how close both the Brimhall's house, and the neighbor's are to the hives

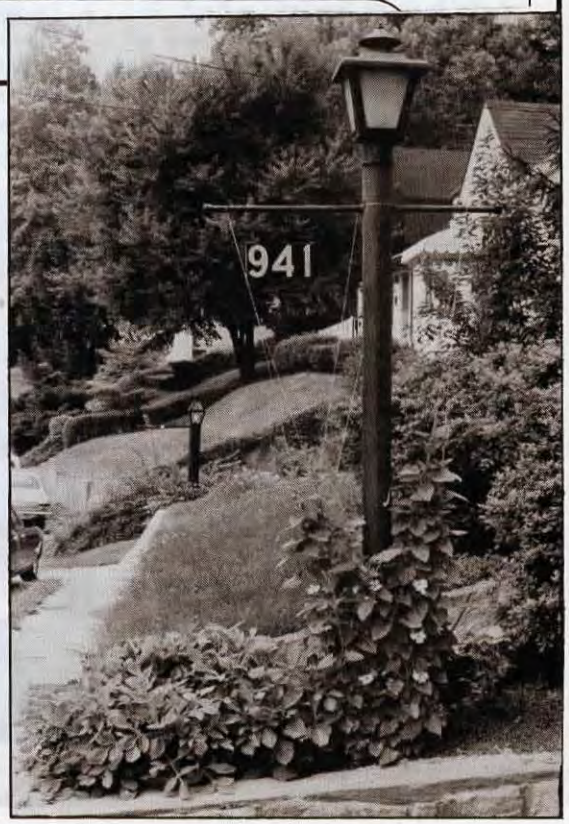


Yard layout. When a yard is well designed and the proper precautions are taken, even a swimming pool next door won't cause problems for a Good Neighbor.

- Beekeeping demonstrations are presented at schools and churches
- An open line of communication is kept between myself and my neighbors so problems do not arise

GENERAL GOOD NEIGHBOR ACTIVITIES

- A member in local beekeeping associations aids in friendship and educational stimulation
- I present talks at beekeeper's (local and state) meetings on such topics as spring management, queen rearing, bee diseases and swarm prevention
- Subscriptions to beekeeping journals keeps me abreast of current issues and developments



INSERT: The front of Brimhall's yard, showing the basic terrain.

TAKE CARE

A Close Look At Liability, Beekeeping and Insurance • Pamela Moore

Bee spill? Glass chip in a jar of honey? Infant botulism?

Do those sound threatening? Only if you've never heard of them before and never heard you may have to foot the bill should they occur because of your bees or honey.

Let's look at bee spills first. Although most hobbyists don't have to worry about moving large numbers of colonies long distances, there are those who do transport bees across the country and have a concern for safety. Some use their own trucks and drive themselves, which pretty well establishes where liability rests. Others lease trucks and drive themselves. Still others contract out to a firm, who they feel get the bees to their destination safely.

Protection here starts with the same watchword discussed in the previous article describing liability for injury — disclose, disclose, disclose. But this time it is not only the beekeeper who does the disclosing — it is every person and agency involved in transporting the bees.

To be well protected, ask the following questions when leasing transportation:

1. Do you have insurance against a bee spill that would cover personal injury, lost time, property damage, and reimbursement for all agencies used to clean the spill?
2. Do you have a certificate that verifies your insurance and may I have a copy?
3. Do you abide by all Department of Transportation regulations in transporting and caring for your cargo?
4. Do you have all permits required to take bees through various states?

(Remember, *you* are responsible for the bee's health, but trucking companies are responsible for the manner in which they are moved.)

If you decide to contract with a transportation broker to move your bees, don't accept the word of someone at the other end of the line that "everything is covered". Having written verification may save court costs at a later date.

Many drivers chose to move their bees themselves, allowing more control of the manner in which they are handled. As in liability for injury, the company of Culbert Davis, Sioux Falls, SD stands out in its field. The program they developed for the American Honey Producers covers all aspects of beekeeping and includes a transit application. The company will not provide coverage for auto or transit written alone. They require one other type of coverage for support.

Roger Starks, agent for Culbert Davis and himself a beekeeper, reports that a single general liability policy is needed. He warned that when insurance is purchased from more than one company and an accident occurs, both companies "stand back and prolong the agony" drawing out court cases and injury suits.

Areas of coverage include the equipment, including honey in the frame and honey in containers. It does not cover bees.

Starks recalls one spill in Oklahoma, "It clouded the highway and was very costly. You have to decide who will pay for this kind of thing — the insurance carrier or you personally"

He also had some words of advice on hiring a transit company. "Get their insurance policy in writing so it will tell you the limits. The company must have

Even the most modern equipment, operated by well-trained personnel, can't guarantee an accident-free trip. Be certain of your insurance coverage when moving bees.

a transit policy. Should something happen, negligence must be proved, and if that happens, the insurance company would back away."

Should you seek an independent insurance agent, begin by looking at companies that insure businesses. They will be able to answer most questions as they are accustomed to dealing with a wide variety of small businesses.

To illustrate the kind of service an independent company is able to provide, the question was put to the W.H. Heffelfinger and Sons Company in Lodi, Ohio. Tom Heffelfinger, after scouting the companies who would insure businesses, brought in Lee A. Janis III, marketing representative for Auto-Owners Insurance to address the bee question.

"We would use an inland marine floater policy on transporting bees. We would take a good look at how the bees are transported, the truck, driver, how much was to be transported, and the cost per hive," said Janis. This is an all risk policy, subject to exclusions. It is liable for the cargo, but does not cover the bees.

So how bad could a bee spill be? Perhaps a few insects buzzing about an interstate or around a town square should a truck overturn? Because uncontrolled bees can cause harm to person and property, they may be classified as hazardous material and lumped right in with toxic waste in their treatment.

Hazardous materials have become one of the hottest topics in the news — and now bees are included in that category. Sheriff John Ribar of Medina County says he has never experienced a bee spill, but that "because it is a threat to life and property, we would use the Medina County Emergency Management Organization." Through this organization, the county Haz Mat team (hazardous materials) would deal with it. He said a beekeeper would be contacted who could offer technical advice.

And who would pay for all this service? Because the Haz Mat team is a group of county-wide volunteers, they do not charge for their services. But if property damage is caused or there is loss of services or bodily injury, the county would go back to the trucking company, driver and owner of the bees to recover costs involved.

No one mentioned beekeeers being involved with the Haz Mat team. As part of a good neighbor policy, a beekeeper would be an asset in such an

Who's In Charge?

The Ohio State University Cooperative Extension Service has been advising farmers of their business needs for years, which are not that different from those of beekeepers. Jim Polson, Northeast District Specialist, Farm Management, presented a seminar on the frameworks available to farmers in which to do business. The form of business could also impact on the liability of the individual farmer or beekeeper.

- **Sole Proprietorship** — One person owning the entire business. This form of doing business makes it easier for one person to get into and out of business. It provides for more freedom of decision, as only one person is in the management position. In this arrangement, only one person is held liable for problems.
- **Partnership** — Two or more people own the business. This can be either general, where ownership rights are not specifically designated, or limited, which defines the boundaries of partnership. Polson advises that liability insurance be carried for any form of partnership.

"Death of a partner causes dissolution of the partnership, however, the business can continue through heirs," advises Polson. He also suggests life insurance on the partners, so that funds would be available to buy out the partner who may die.

In a partnership, there can be one or more general partners and one or more limited partners. There is limited liability for limited partners as long as they do not participate in management.

- **Corporation** — Usually a group of people who form an association and are authorized by law to act as a single person, although constituted by one or more persons and legally endowed with various rights and duties.

The separate entity of the corporation allows liability to fall to the corporation, keeping personal assets at a distance. This does not totally limit liability, as litigation may be tried against the persons involved in the corporation.

Corporations cause more paperwork and organization. The IRS may look at reasonable compensation paid to employees. Profits distributed as dividends are also double taxed.

Some considerations outlined by Polson that the small business person must be aware of in a corporation include: concern about minority interest holders; a tax on dissolution of the corporation; valuation of stock on death or sale; the possibility of discounting minority interests; and the continuation of business on the death of a shareholder.

Before setting up business in any form, consult with an attorney to determine your business needs and the extent these will expose you to personal liability. □

Super Beekeeper? No, a Hazardous Materials suit, ready to go.

emergency — at least as an on-call advisor. Educating the teams to what must be done is a good form of preventing panic or mismanagement of a spill.

Ribar also said that not all accidents are caused by the trucker. "Who knows when a drinking driver could cut off a truck, causing it to flip over, or when someone slams into the rear of a truck full of hazardous material," he asked?

Even before considering moving bees, it is a good idea to find out if it is legal to move them through the planned route. Most municipalities do not have ordinances against it, only because they haven't given it much thought. Making sure first limits a beekeeper's liability should negligence be an issue.

In the Rhode Island Apiculture Law, a movement permit is required to bring bees into the state. This is not a safety factor to limit liability, but a disease control issue. Within 15 days prior to moving the bees, or used beekeeping equipment, into the state — application must be made with the environmental management director.

Enough of moving bees, what about your honey? What happens (heaven forbid) if someone isn't pleased with your product? It may not be enough to simply refund the money, or replace the jar — especially if bodily injury has occurred.

Most beekeepers have not experienced this problem, but in a time when product liability suits are up, who can afford the time or expense to fight one?

When asked what type of product insurance he carried on his product, Robert Mattingly of Chatham, Ohio, said, "*I* eat it." Although a small producer who sells his honey at senior citizen Christmas shows and from his home, his honey is a well known product in the county. He reports that he has never had a problem or complaint, and didn't expect one. He is a third generation beekeeper and practices safety and caution during all steps of his honey production. This tends to be the attitude of most conscientious, small-production beekeepers.

Dorothy Tonn, of Tonn's Honey near Massillon, Ohio, has purchased product liability along with her regular beekeeper's liability. The Tonns keep between 350 and 375 colonies within 20 miles of home and market their honey to stores which then resell it. "We had to have it (product liability) because of the way we market. The worst that has happened is a customer finding a jar lid loose," she reported.

Tom and Dorothy Tonn had regular homeowners insurance but had to change companies because of their beekeeping business. "We found a good policy through an independent agent who supplied everything we needed," added Dorothy.

Auto-Owners Insurance representative Janis also offers product liability. "If the honey goes to a state where we do not sell insurance, we wouldn't offer it. As long as it is within a state where we do business, it's O.K.," he said.

He added another thought for beekeepers to consider, "We also offer a business interruption insurance." A good thought if a product liability suit would hold up production and distribution of honey.

The American Beekeeping Federation offers product liability only when written in conjunction with basic liability insurance. It will not insure products after control of the product is relinquished to others and is away from the insured's premise. Limits must be identical for combined basic liability and for products.

Roger Starks reports that Culbert Davis will cover bee products sold anywhere in the United States and Canada. "If the product is sold in Italy, they could come back to court here, but no one would fight it in an Italian court," he said. Because honey is a value added product — the beekeeper sells to an outlet, then the outlet sells to the public — it would be "tough to prove" that the producer was at fault.

Starks reports that most beekeepers are running their businesses under a sole proprietorship (see 'Who's In Charge'), but that other methods of doing business could limit liability. The only thing the insurance company needs is the name under which the beekeeper is doing business. Under a corporation, the name of at least one individual owner is required.

Problems with the product can range from a loose lid to a sliver of glass broken away from the bottle, to foreign matter in the honey, but one problem cannot be seen — the spores that cause infant botulism.

Claims of infant botulism have affected some major honey companies, but most small producers have given it little thought.

One major honey producing company is being sued because of it, and although the company may not discuss the cases due to pending litigation, one spokesperson did say that the company carried basic liability insurance. No warning labels are on the jars of honey, but they regularly send information to pediatricians about infant botulism.

The Ohio State University Extension Service has provided publications dealing with infant botulism and reports that it occurs in infants aged two weeks to nine months. The average age being hospitalized is ten weeks, with ninety-eight percent being between two weeks and six months of age. Since 1976 there have been over four hundred cases identified in the United States. Eleven have died.

In 1976 it was discovered that not only foods canned at home carried botulism spores, but that the toxin also devel-

ops in the intestinal tract of infants. It blocks the nervous system's ability to send messages to the muscles. Spores may be found in house dust, raw fruits, vegetables, corn syrup and honey.

In its 'Honey Connection', the Extension Service presents other possibilities that do not condemn honey altogether:

"Of the several hundred food items tested in association with the California cases of infant botulism *Clostridium botulinum* was found in honey. Contamination of honey occurs before the honey reaches the home. Using current laboratory methods, about ten percent of honey is contaminated by *Clostridium botulinum* spores. As honey is currently processed, these spores cannot be destroyed. Although honey represents a significant risk factor in infant botulism and is the one identified, avoidable source of *Clostridium botulinum* to date, ***honey is not the source of spores for most of the infant botulism cases*** (emphasis mine). Although it is desirable to eliminate honey from the infant's diet, it will not eliminate infant botulism. Worldwide, only thirty-five percent of babies with infant botulism were fed honey. This fact emphasizes that additional factors play an important role in getting infant botulism."

Robert Mattingly — "My family and I eat my honey, and that's good enough insurance."

Groups that have advised that honey not be fed to infants less than one year old include (according to Ohio Extension), The USDA, the California Health Department, the Center for Disease Control, the American Academy of Pediatrics, the Honey Industry Council of America and the Sioux Honey Association in Sioux City, Iowa.

You would think that with these kinds of warning, most of the population would know not to feed honey to infants — but not true. Many mothers have raised their children on honey with no adverse effects. But if this kind of objection is raised, it could be a cause of concern and liability and should be discussed with the insurance carrier.

Proving that all precautions have been taken, both in production and transportation of your bees and their produce is the best way to avoid trouble. Documenting how precautions were taken and having adequate insurance should make you feel secure because you are producing the best possible product, and moving it in the safest way possible. □

DAN HALL . . .

ON EXPORTS

And the U. S. Honey Industry

The National Honey Board, with targeted Export Assistance grants from the USDA's Foreign Agricultural Service, has launched a program to expand the sale of U.S.-produced honey overseas. The export promotion program has spurred many questions from producers. The following are some questions posed to Dan Hall, executive director of the National Honey Board and his responses.

How much does the government spend on Targeted Export Assistance funds?

In fiscal year 1989, the USDA's Foreign Agricultural Service awarded 200 million in TEA grants to 47 participant organizations. For fiscal year 990 they are awarding $200 million to 6 participants. The TEA program grants provide assistance to U.S. agricultural commodities in countering the effects of unfair trade practices on the part of foreign competitors.

Are these TEA funds paid by the taxpayers?

TEA funds refer to grain certificates issued by the USDA Commodity Credit Corporation (CCC). The CCC issues these excess grain certificates to worthy commodity groups such as the raisin, walnut and honey industries, to use ONLY for export activities. This is a special five year program, designed to deplete the stockpiles of government owned grains, and no additional taxpayer funds have been used for these efforts.

How much will the National Honey Board receive?

In 1989, the National Honey Board was allocated $500,000. The Board will receive up to $1 million in a 1990 TEA grant.

How did the honey industry qualify for these TEA funds?

In order to qualify, the NHB reviewed the long history of the U.S. honey industry and documented the continual battering the U.S. producer has been taking at the hands of foreign suppliers. For example, millions of dollars of tangible damage has been caused by unfair trading practices of third world supplier nations, who produce honey solely for the purpose of dumping in the United States. The U.S. honey industry has also been victimized by nations who historically have produced far more than the world market can bear causing havoc on the U.S. market — and lower returns.

Most significantly, we discovered that millions of dollars worth of honey had been systematically blocked from the world trade by governments exercising outright bans on our product; other governments encourage unrealistic testing criteria. In fact, more than 10 million dollars in honey has been unfairly blocked from the world trade in the past three years! U.S. honey exports have been as high as 20 percent of domestic production, but by 1987, had reached a low of about 3.5 percent of domestic production.

"Recent estimates predict a 46,000 metric ton world shortage for 1989-1990. There's a real world honey shortage."

How much of this assessment money will be spent overseas?

The FAS requires that industry money (assessment dollars) be allocated by the National Honey Board in order to receive the TEA grant. Generally, the ratio is about 20 cents from the National Honey Board for each $1 from USDA's FAS.

Certain expenses, such as travel related expenses **will not be paid by FAS.** TEA grants **must** be spent overseas on actual program work.

Are travel expenses in addition to the 20 cents?

No. Travel expenses can be included as part of the NHB investment.

Dan, everyone knows that the producers and importers fund the Honey Board. What benefits are they going to gain from the export promotions?

Under the Law, the Board's purpose is to "maintain, develop and expand markets for honey and honey products" The export market is simply another product outlet for U.S. honey. If more U.S. honey is moved out of this market into foreign markets, that strengthens demand for the remaining honey.

Many feel that the export program is taking funds and energy away from the domestic promotion program. Is this true?

No. In fact, the export promotion program enhances the domestic promotion efforts.

NHB assessment monies used for export development can serve double duty. For example, certain expenses for photography, advertising artwork, office rent, utilities and travel can be charged against the required funds that NHB must contribute in order to receive federal grant dollars. In other words, these items are included as part of the 20 cents that the National Honey Board must contribute to receive one dollar from the FAS.

You said the National Honey Board must cover travel expenses. Are Honey Board members and staff traveling to foreign countries? And if so, why?

Trade teams from the National Honey Board Export Development Committee travel to the target export markets (see pie charts) to meet with the in-country agricultural trade officers of the FAS; to meet with local beekeeper organizations; to meet with key importers, packers and buyers and their trade groups; and to hold interviews with the trade press. These visits allow us to introduce ourselves and to explain our intentions toward strengthening U.S. honey sales in those markets. Also, these visits allow time to meet and work on a one-to-one basis with our TEA in-country representatives. Trade teams have visited Japan, Saudi Arabia and West Germany.

Beekeepers, by the way, are the finest ambassadors of the industry you could ask for. They meet one to one with fellow beekeepers abroad and foster understanding of our industry. This will have a profound impact on agricultural policies of honey importing nations and can help prevent access problems in the future. Trade team members are volunteers, who have endured 15-hour flights, 24-hour working days, and hardship situations abroad to present the position of the U.S. honey industry.

"I believe the U.S. can compete very well with third world countries if we use the proper marketing techniques and strategies."

How much honey does the United States currently export?

In 1988, the United States exported 6,300 metric tons of domestically produced honey. This was the highest level of exports since 1983 (see chart). These 1988 honey exports often received a premium price. The goal of the National Honey Board is to increase export sales to 15% of domestic production within 5 years.

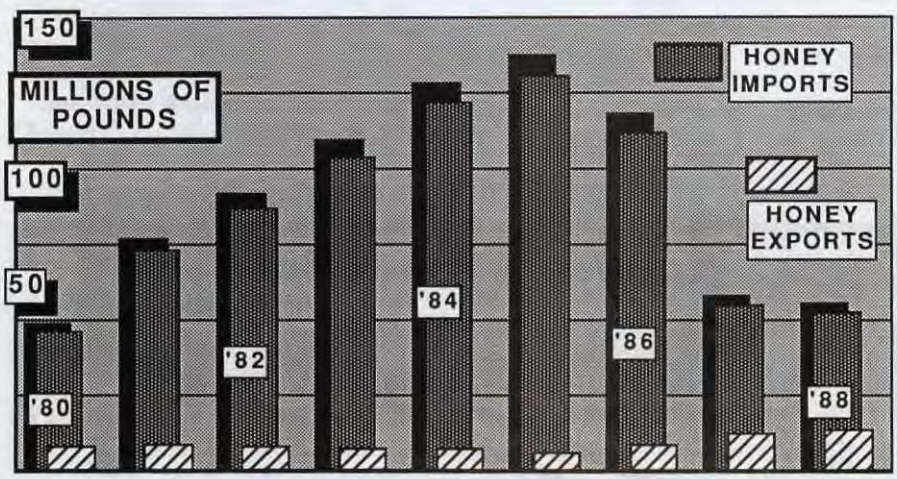
What is the National Honey Board doing about hydroxymethyl-furfural (HMF) and other trade barriers?

We're working to overcome obstacles such as HMF and other unfair standards of testing. Many U.S. honey exporters have very little difficulty meeting the HMF standard imposed in Germany and other countries. They must, however, not heat their honey, use care in extracting and processing and market their honey quickly after extraction.

In order to help U.S honey exporters overcome HMG and other **unfair** standards of testing, the NHB is investigating the use of an independent testing laboratory which could supply exporters a reasonably priced testing service prior to overseas shipping. We have also requested permission from the Agricultural Marketing Service to file for a "Certificate of Review" with the Department of Commerce in order to allow us to certify that honey has met the marketing standards for HMF and other specifications required by foreign buyers.

What about those tariffs we keep running into?

The United States faces some unreasonably high tariffs on honey. Japan, for example, imposes a 30% ad valorem tax, while the European economic community imposes a 27% ad



The import to export ratio in the U.S. has never been very good but in 1987 this began to change. Imports decreased significantly due to new subsidy rules and far more domestic product was used in main stream commerce instead of sitting in government warehouses. This also made product available to foreign buyers and increased exports were the result.

valorem tariff. The National Honey Board cannot become involved in the tariff issue, which must be left to the various trade associations representing the honey industry.

Can the United States really compete with third world countries in the world market?

The implication of the question is, I think, that Canada, Australia, New Zealand and others are third world countries. They would probably disagree with you. But yes, I believe the United States can compete very well, using the proper marketing techniques and strategies.

Well then, can we compete with countries like China and Mexico?

There are specialty honeys produced in the United States and no where else in the world that are in particular demand by bakeries and other food manufacturers around the world which, if properly marketed, would allow us to compete in the bulk market, even with nations like China and Mexico.

Also, understand that the world honey situation has changed during the 1989-90 marketing season. Instead of facing the traditional surplus and low prices of the last 10 years, the world for the first time in a decade faces a shortage of honey. Estimates at a recent world congress held during the APIMONDIA Conference in Brazil projected a 46,000 metric ton world shortage of honey in the 1989-90 marketing season. Even third world producers are finding it very difficult to produce and sell honey at the unrealistically low prices that have prevailed in world markets in the last few years.

One question we often hear is, why is the Honey Board trying to promote U.S. honey overseas when the United States has to import honey to fill the domestic demand?

Honey, like many other commodities including cereal grains, is both exported and imported by the United States. The goal of the honey export program is to expand the sales of high quality, high value U.S. honey and honey products. The United States produces several large marketable supplies of specialty honeys of exquisite quality such as citrus blossom, light clover, tupelo, buckwheat and other monoflora honeys which are in demand by export markets. Specialty honey producers have marketed their products abroad by informing potential customers of the characteristics of these special variety sources. The U.S. honeys appreciated by world market buyers are often not as well appreciated in the domestic market.

So, the reason we promote U.S. honeys overseas is to both **strengthen the total demand** for domestic honey, plus **improve the financial return** to producers and others involved in the industry.

"The Honey Board WILL capture a larger share of the world honey market."

This year, as you said earlier, there will be a shortage of honey. Why promote overseas when the U.S. packers are willing to pay more money but are still having trouble finding product honey to fill current domestic demand...a demand the Honey Board helped to create?

Developing our export market is a long term commitment. While domestic production is down this year, you cannot promote a product only when there is a surplus. Promotion for the domestic and export markets is a building process. First, awareness builds. Then, trial builds. Connections and relationships build. We cannot promote honey sporadically...either here or abroad. We can focus on gaining the best premium prices for U.S. producers and build overall demand for the fat and the lean years.

What are the National Honey Board's strategies for increasing export honey sales in 1990?

We have established a three tiered strategy to capitalize on the overseas consumers' demands for U.S. honey varieties and to counter the adverse trade structures which limit our market entry. These include working in partnership with the in-country honey import trade, encouraging them to trust and increase imports of bulk U.S. honeys; to provide direction for U.S. honey packers in establishing brands in areas with potential for U.S. bottled products, without disrupting U.S. bulk sales; and to help develop honey-manufactured products which **require** certain characteristics of U.S. supplied floral sources of honey.

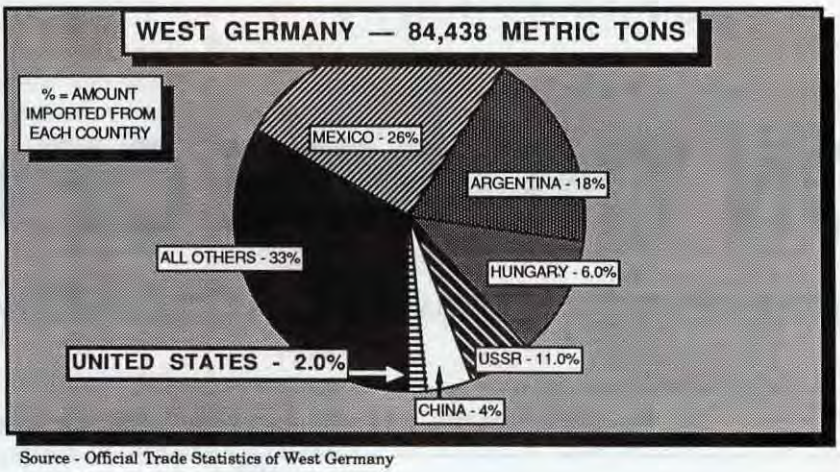
Dan, would you summarize your hopes for the U.S. honey export program?

The U.S. honey export program will strengthen the demand for U.S. honey in foreign markets which in turn will strengthen the domestic market.

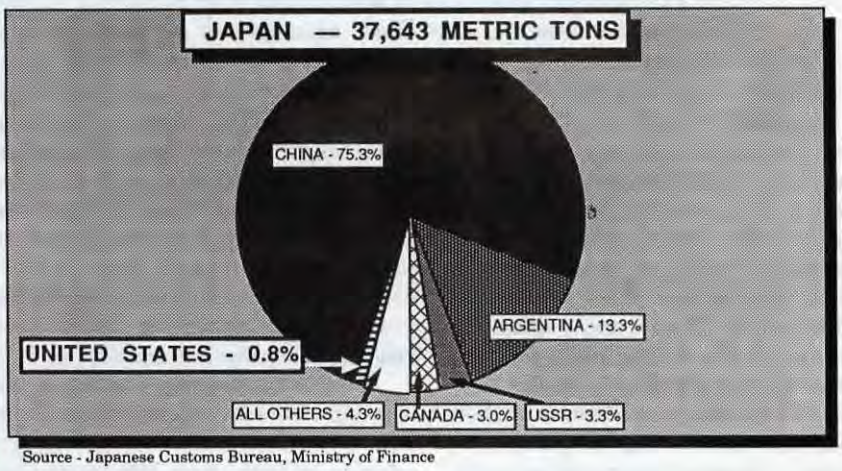
Like many other U.S. industries, U.S. Honey producers have always considered the market to be the 48 contiguous U.S. states. That was probably true fifty years ago, but the world has changed, with goods from all over the world able to reach U.S. consumers. Unfortunately, not all U.S. industries have realized that trade is a two-way street and have found themselves being a "dumping ground" for imports from all over the world. Only in recent years have U.S. industries realized additional market potential for their goods and services overseas.

The U.S. honey industry can either look inward with more and more pressures from outside sources, or raise its vision to look to the world as a place to market U.S. honey and honey products. The choice of the National Honey Board with the help of the USDA's Foreign Agricultural Service is to begin work to capture a larger share of that world honey market. □

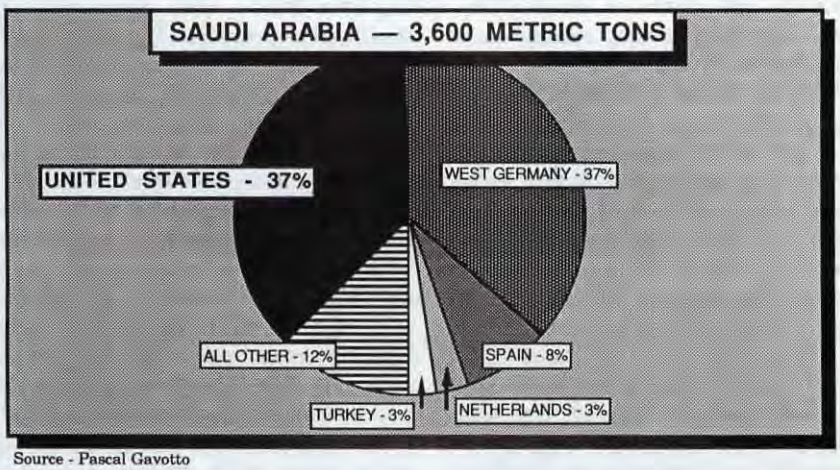
U.S. agriculture exports rose 26% to $35.2 billion for fiscal year 1988, as reported by the USDA. The total was up more than $7 billion from 1987's $27.8 billion figure. Wheat accounted for two-thirds of the volume increase, and corn, feeds and vegetable oils also increased.



Source - Official Trade Statistics of West Germany



Source - Japanese Customs Bureau, Ministry of Finance



Source - Pascal Gavotto

The three countries the Honey Board has focused on - West Germany, Japan and Saudi Arabia - all import large quantities of honey each year (figure at top of each chart). These show what percent of each countries honey imports come from the U.S. Obviously there is a large market that U.S. producers can tap in each of these countries and isn't yet.

ON THE SIZE OF CELLS

SPECULATIONS ON FOUNDATION AS A COLONY MANAGEMENT TOOL[1]

E. H. Erickson†, D. A. Lusby+, G. D. Hoffman† and E. W. Lusby+

This two-part article is the result of an extraordinary amount of detective work following the twisted routes of many leads. It is about the numerous ways that can be found to complicate an otherwise simple issue. Our purpose is to challenge all in apiculture to question even the most basic assumptions we make when developing sound colony management strategies and interpreting research results.

Domestic honey bee colonies, which beekeepers manage and scientists study, differ in many ways from native or long-established feral (wild) counterparts. These differences are quite similar to those found in other animal species that have undergone domestication. Today, most domestic honey bees exist as artificially selected strains kept in artificial domiciles (box hives). Feral honey bees, on the other hand, exist as naturally selected populations — the colonies are entirely self-sufficient and have adapted to life in naturally occurring cavities. It is imperative that both beekeepers and researchers are aware of these differences when they develop management strategies to solve problems facing the beekeeping industry. Research results from studies using domesticated bees in Langstroth hives are not necessarily applicable to feral bees and vice versa. Periodically, we remind ourselves of this. Yet, in spite of our best intentions, it seems that we (as well as others) often overlook the obvious. So it is with the issue of comb cell size in our bee hives.

Until recently, we gave little thought to the issue of comb cell size. We presumed the subject was adequately researched in the past and all keepers of bees were using similar foundation. However, we have found this is not the case! In fact, beekeepers may be using combs drawn from foundation with differing cell sizes, either in the same apiary or, perhaps in the same hive, particularly if the foundation or combs were purchased from several sources. How can this be, you ask? To answer this question we need to first examine the issue historically.

In the beekeeping literature we found that controversy has followed the issue of optimal cell size for domestic colonies for more than 100 years. Our review starts with the invention of foundation by Mehring in 1857. By the 1880's European beekeepers were using foundation with comparatively small cell impressions. Shortly thereafter, Professor M. Baudox, through his research at Tervueren, Brussels, Belgium, concluded that this small cell size, 920 cells per square decimeter (=5.0 mm width per cell), was detrimental to colony development and productivity. He then proceeded to experiment with foundations of increasingly larger cell size. Subsequently, he demonstrated that adult honey bees were larger when reared in comb with larger cells (1). (See "Conversions" page 99 and footnote for mathematical conversions of some common cell sizes, because some early writers published incorrect conversions.)

Unfortunately, Professor Baudoux was a proponent of the now disproven Lamarkian theory of evolution which proposed that "...environmental changes cause structural changes in animals and plants by inducing new or increased use of organs or body parts..." and that such changes are inherited. This theory would suggest, for example, that the elongated neck of the giraffe is the result of each generation stretching further for the top branches of trees while feeding. Baudoux believed that he could genetically alter the size of honey bees by providing them with larger than normal cells for brood rearing. Hence, in his research he tested and later advocated the use of oversized cells (as few as 650 cells per dm^2 = 6.0 mm per cell). As proof of his theory Baudoux demonstrated, as have others, that bees reared in small cells were significantly smaller than those reared in large cells (4). However, no heritibility of size was demonstrated. Neither did he demonstrate that the ability to produce larger cells under these circumstances was genetically determined.

Charles Darwin, in his now widely accepted theory of natural selection, proposed "...that organisms tend to produce offspring varying slightly from their parents and the process of... selec-

[1]Mention of a trademark, proprietary product, or vendor does not constitute a guarantee or warranty by the USDA an does not imply its approval to the exclusion of other products or vendors that may also be suitable.

† U.S. Department of Agriculture, Agricultural Research Service, Carl Hayden Bee Research Center, 2000 E. Allen Road, Tucson, AZ 85719.

+ Rangeland Honey, 3832 Golf Links Road, Tucson, AZ 85713.

tion tends to favor the survival of individuals whose peculiarities render them best adapted to their environment..." and that such changes are inherited. Hence, selection for larger queens results in the production of larger daughter queens and worker bees (as well as drones). Larger bees must be reared in larger cells to maintain their size. Conversely, we can select for small bee size and then produce these smaller bees in smaller cells. We now know that ***bee size is a function of BOTH inheritance and cell size.***

It is a curious thing, this conception that bigger is better. Clearly, larger worker bees come from larger, easier to find queens. The workers have longer tongues, larger honey stomachs and store their honey in larger cells (1,2,4). However, there is no evidence that a colony made up entirely of larger bees produces a greater honey surplus than a colony of small bees.

Additionally, there are no reports of studies comparing the rate of population growth or peak population size between colonies comprised of small versus large bees. Even so, researchers have shown that colonies of smaller, Africanized bees (AHB) do build up more rapidly than colonies comprised of larger European bees: however, research is needed to determine whether or not cell size is a factor. Finally, and perhaps most importantly, no one has investigated the influence of cell size on the developmental rate of individual bees, susceptibility to disease and parasitic mites, overwintering survival, or other biotic and abiotic stress-inducing factors.

"It is a curious thing, this conception that bigger is better."

The cell size of "natural" worker comb, as measured among the various races of bees, is reported to be variable, ranging from 700 to 950 cells per square decimeter. However, there seems to be a consensus suggesting that, for most races of honey bees, natural worker comb cell size is 857 cells per dm^2 (5.1 mm per cell) (5) and ranges from about 830 to 920 cells per dm^2 (= 5.0 to 5.3 mm per cell). (Note also that 920 cells per dm^2 was the size which Baudoux argued *against* See "Cell Tell".)

In the United States, from the late 1800's to the early 1900's, the "standard" cell size for manufactured foundation was 857 cells per dm^2. However, in the early 1900's there began a subtle transition to larger cell size by some but apparently not all manufacturers of comb foundation. By 1913 at least 2500 foundation presses with 736 cells/dm^2 (=5.6 mm per cell) were sold in Europe by the Rietsche Co. in West Germany. As a result, the current world industry "standard" for worker cell size is between 725 cells per dm^2 (= 5.6 mm per cell) and 800 cells per dm^2 (5.4 mm per cell). Most foundation currently manufactured in the United States ranges from 700 to 857 cells per dm^2 (=5.2 - 5.7 mm per cell).

We have examined twenty-five samples of foundation from a number of foundation manufacturers in the United States and around the world. We have also examined three mills, which we were able to obtain for comparison. The cell size of each is summarized elsewhere and is based on 10 measurements each of 10 linear cell impressions (see "How Big").

Foundation with 700 cells per dm^2 has cells 10.7 % wider than natural comb cell size. Colonies utilizing the smaller natural cell size (857 cells per dm^2) could produce 22.4 % more brood per given area of comb than colonies on 700 cells per dm^2. Similarly, such colonies could rear 7.1% more brood than colonies on 800 cells per dm^2. Utilization of 857 comb would, almost certainly, require less metabolic energy expended per bee to maintain optimal temperature and humidity for brood rearing. It is possible that developmental time might also be shortened. Both factors would translate into more rapid spring buildup and recovery from bee losses due to parasites, disease or pesticides.

The question that must now be raised is why has the

CONVERSIONS

Relative values for cell size using various popular units of measure.

# cells/dm^2 (2 sides)	# cells/ inch	# cells/in^2 (2 sides)	cell width in mm^2
650	4.3	41.9	6.0
700	4.4	45.2	5.7
725	4.5	46.8	5.6
750	4.6	48.4	5.5
800	4.7	51.6	5.4
830	4.8	53.5	5.3
850	4.9	54.8	5.2
920	5.1	59.4	5.0
950	5.2	61.3	4.9
1050	5.4	67.7	4.7

Cells per square decimeter (dm^2) is a useful unit of measure for understanding colony population dynamics and for developing management strategies, but, for practical field diagnostics it is easier to measure the width of a row of 10 cells measured side to side. A dm^2 is an area 10 cm by 10 cm; cells on both sides of the comb area are counted. To convert cells per dm^2 to cells per linear dm and then to mm per cell use equation 1:

Equation 1:

cells/dm^2 = 2.31 X N^2 (where N is the number of cells per linear dm)

Example: 850 = 2.31 x $(19.18)^2$

Divide 100 by cells per linear dm to obtain mm per cell

Example: 100 divided 19.2 = 5.2

To convert cells per in^2 to inches per cell:

Equation 2:

cells/in^2 = 2.31 X N^2 (where N = number of cells per inch)

Example: 54.8 = 2.31 x $(4.87)^2$

To convert cells per dm^2 to cells per in^2:

Equation 3:

cells/dm^2 = 15.5 X cells/in^2

Example: 850 = 15.5 x 54.8

The values in this column represent the width of a single cell as measured between centers of opposing cell walls. The actual cell interior width is one cell wall thickness less than this value.

beekeeping industry, in the United States and elsewhere, accepted foundation with 700-800 cells per dm^2 (= 5.7-5.4 mm per cell) as a size standard. We may never know, but it seems likely that it has its roots in the mistaken Lamarkian theories which guided the early studies of Baudoux. These studies were followed by those of Gontarski who found that the greatest percentage of bee size change occurs using a cell size of 700 cells per dm^2 (5.7 mm per cell) (5). Our investigation suggests that many of the rollers used in mills manufacturing foundation in he United States are made in Europe and the producers of these rollers follow the precepts of Baudoux and Gontarski. At least one of these companies currently making rollers (Rietsche in West Germany) was making flat molds for foundation in 1899. Another explanation might lie in Baudoux's contention that combs with small cells contribute to swarming (1). However, Baudoux also advanced the opposing view that larger bees would produce more body heat leading to increased brood production. Certainly, larger bees resulting from selection and breeding require larger cells for development. There has also been concern that the buildup of larval debris and cocoons in cells reduces cell size. Thus, there is perceived benefit to be gained from starting with a larger cell.

Clearly, reported differences in cell size and in bee size between domestic (European) bees reared in large cells and Africanized honey bees reared in naturally built comb have often been misinterpreted. It is not so much that AHB cells are somehow smaller, but rather the cells built by bees from domestic strains are abnormally large. It is worth noting that the cell size range reported as 'natural' for feral bees has varied little from the 1600's to the present time (see "Cell Tell"). Also noteworthy is the fact that the size range currently cited by various authors as indicative of Africanization (e.g., reported averages = 4.9 - 5.1 mm; range = 4.5 - 5.4 mm)

CELL TELL

Documentation of natural cell size.

Source	Year	Original Unit of Measure	Cell Width in mm	Range
Swammerdam	1600's	cells/dm^2	51	
Maraldi	--	"	--	5.0-5.4
Reaumur	1700's	"	5.3	
Klugel	--	"	5.3	
Castillon	--	"	--	5.3-5.5
Latreille	1800's	"	5.4	
Vogt	--	"	--	5.3-5.5
Collin	1865	"	5.2	
Langstroth/ Dadant	--	"	5.3	
Root	1876	cells/inch	5.2	
Chesire	1886	"	5.1	5.06-5.45
Cowan	1898	cells/in^2	5.1	4.72-5.36
Cook	1904	"	5.1	5.06-5.45
Miller	1910	"	5.1	5.11-5.29
Grout	1937	cells/dm^2	--	4.95-5.49
Taber & Owens	1970	mm/cell	5.2	4.99-5.45
Dadant	1946	cells/dm^2	5.2	5.06-5.20
Dadant	1975	"	5.2	
Messange & Goncalves	1985	mm/cell	5.1	5.07-5.11

significantly overlaps that of natural cells built by European bees (e.g., reported averages = 5.1 - 5.2mm; range = 4.7 - 5.5mm) by a wide margin. □

The authors wish to thank H. Don who measured all foundation and mill specimens and C. Shipman who helped us assure the accuracy of our mathematics. We also thank all those people who kindly provided us with foundation and mills for examination.

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Part Two of this article examines the effect cell size may have on various pests and diseases and particularly what this all will mean regarding cell size and the African Honey Bee.

HOW BIG

Measurements of cell impressions from foundation and foundation mills produced by various supply houses from the late 1800's to 1989.

Type	Source	Average Cell Size in mm
wax	Africa	4.76
wax	Africa	4.89
wax	A.I. Root (circa 1929)	5.05
aluminum	unknown	5.10
mill	A.I. Root (circa 1929)	5.12
wax	L.A.Honey (1989)	5.15
wax	Miller (circa 1888)	5.18
wax	Mexico	5.18
wax 5-3/8"	A.I. Root (1989)	5.18
wax	Glorybee, OR	5.19
wax	Tom Industries, CA	5.19
wax	Honey Acres, WI	5.19
mill	A.I. Root (1989)	5.20
wax 8-3/8"	A.I. Root (1989)	5.20
plastic	Arnaba, HI	5.21
plastic	unknown	5.23
plastic	unknown	5.28
wax	W.T. Kelley, KY	5.28
mill	A.I. Root (circa 1910)	5.29
wax	Brushy Mountain	5.30
plastic	unknown	5.35
wax 8-5/16"	Dadant (med. brood)	5.36
wax	Honey Acres, WI	5.39
wax 5-1/2	Dadant (med. brood)	5.39
Duraguilt	Dadant	5.40
wax	Bolivia	5.44
7-11	W.T. Kelley, KY	5.53
Perma-dent	Draper's, NE	5.56
Perma Comb	Perma Comb	5.64

Change A 'NO' To YES!

RICHARD THOMAS EDWARDS

There is an old saying that goes "you can't please all of your customers all of the time" If you are new at this business you'll soon find you're not the only voice in the cold world of honey selling. You can expect to be told "no" in a wide and diversified assortment of ways.

Not to worry though, because being told "no" can actually be a good thing. You can learn a lot, and you shouldn't worry about "no" when you offer honey to customers or other sources.

Remember, YOU know more about the benefits of your honey than almost all of your potential customers. The best you can do is show them how the use of honey is beneficial to them. While you may not initially see your efforts in the form of sales, you will be educating and informing future users on the value and importance of your merchandise.

So, what does being told "no" really mean? Well, for one thing, sometimes a negative reply is truly sincere. A customer may already have a ready supply of honey from another source. Or, they may simply have a chemistry problem that keeps them from using it. Too, they may simply not like the taste of honey and prefer using other kinds of sweeteners.

These are the types of customers you cannot sell your honey to. But, at the very least, you can educate and inform them on the value of bees, beekeeping and any other products you offer.

For certain, the art of selling honey can be challenging and fun — even when the customer says "no" Furthermore, NEVER take "no" (or the other unkindly remarks you may hear) the wrong way and most importantly, NEVER take a remark personally.

Remember, too, the bees did the work, you simply harvested the bounty. Should it matter to you what customers say in regards to their own personal beliefs? After all, in the final analysis, who is really losing out here?

Sometimes a "no" remark can actually be a "yes" reply. As you grow with your business and begin to establish yourself as a salesperson, you will discover this to be true. You can almost sense when a future customer is telling you "no" but means something else. It's not because they're not interested but rather they're uncertain why they should even buy your honey. When this happens, here's a simple trick that will help.

"To Change a NO to a YES — Simply Listen."

The most effective way to communicate with a customer who wants to buy honey (but doesn't know it yet) is by repeating — word for word — what the customer said, and then follow it with a "May I ask why?" question.

Then you say, for instance, "Yes, sir. If I understand you correctly you said you use honey but you are not very much interested in this honey because it is too (dark, light, medium) colored."

This should convince them that you have been listening and want to discuss this further.

After all, you have the right to discover just how knowledgeable your customers are on the use of honey, its colors and shades and anything else that will help you sell.

So, when a customer tells you "no", ask why and then use the remark to open up the line of communication concerning their reason for not wanting to purchase your merchandise.

Remember, too, almost anywhere you go and at any time of the day you are in contact with people and you must consider them to be future honey users. Bring along your business cards, perhaps some honey sticks, too. A weekend romp down at your local mall, especially on payday, can net you from ten to 100 future customers.

They may tell you "no" when you contact them, but using those free samples and combining the sample with a business card may very well change that "no" to a "that was great, how do I get to your place of business" phone call.

However, if you just can't face a "no", you can try using a flier with your phone number and a honey stick attached to it. Placing these on vehicles — after acquiring approval of the local mall manager can also net you results. The fliers that include a special introductory discount coupon that are *not* returned with a smiling customer attached can be considered your "no" customers.

Again, not everyone is going to say "yes" It is up to you to talk with your future customers and educate them on the value and importance of your honey or other products.

Believe it or not, it can actually be fun being told "no". And it is something you will want to learn how to deal with as you and your honey business grow. □

Beauty and the Bees

B. A. STRINGER

Cotoneasters are hardy shrubs which thrive in poor soil with little maintenance and are valuable in a large number of landscaping situations. Over 50 species of Cotoneaster are in cultivation. They are originally from the temperate areas of Europe, North Africa and Asia, and they flower and fruit more freely on hot dry slopes rather than in rich moist garden soil.

The flowers are often tiny, resembling miniature single roses, and are white or pale pink when they open in spring. Their copious nectar is easily accessible to honey bees, and seems to be very attractive, as the flowers are reportedly visited even during the basswood nectar flow.

All species of Cotoneaster look best when allowed room to arch or spread without having to be pruned at the edges. Some of the oldest wood can be removed each year and taken out to the base of the plant. Dead or out of place branches can also be pruned out.

Rock Cotoneaster, *Cotoneaster horizontalis*, is probably the most attractive of the genus to honey bees. The very small pink flowers are intensively worked for both nectar and pollen during the May bloom period. This shrub grows low and spreads wide. Its twiggy, angled branches are covered in tiny bright green leaves which turn orange and red in Fall. There is also a variegated form with leaves edged in white. Although deciduous, the shrubs are out of leaf for only a short time. The showy, shiny fruits line the stiff branches like strings of bright red beads.

A native of western China, Rock Cotoneaster is hardy in this country to Zone 6, or about -10°F. Its low spreading growth habit suits landscaping uses such as bank covers, fillers, and low traffic barriers. If pruning is needed, cut out whole branches rather than snipping ends, in order to maintain the plant's form.

Another species, Rockspray Cotoneaster, is available in a large number of varieties, the best ground cover of which is *C. microphyllus cochleatus*. Native to the Himalayan region, this low, wide-growing shrub is hardy to about -5°F. Evergreen, prostrate and compact, it follows the contours of the rock or ground over which it grows. Tiny dark green leaves and white flowers line the branches. Rose-colored berries appear in fall. It is an excellent ground cover for a bank or steep area, but should not be given too much water or fertilizer.

Parney Cotoneaster, or Red Clusterberry, (*C. parneyi*), is an evergreen arching shrub which grows to about eight feet. The leathery, deep green leaves are silvery on their undersides, and grow all over the plant, even to its base. Parney Cotoneaster is useful as a screen, clipped hedge or espalier. White flowers producing nectar and dull yellow pollen are followed by clusters of red, long-lasting berries. Originally from western China, *C. parneyi* (also called *C. lacteus*) may be hardy as far north as Zone 6.

Cotoneasters may be propagated from seeds, layers or cuttings. Rare kinds may be grafted onto root stocks of quince or hawthorn.

Fireblight can sometimes affect this genus. This serious bacterial disease is easily recognized. Its symptoms are the sudden wilting and blackening of branches and twigs. The best treatment is to cut out the affected growth, making the cut well below the damaged area. Burn the infected limbs. Sterilize your cutting tools with disinfectant (alcohol) between cuts, so you don't spread the disease.

The name Cotoneaster is derived from the Latin 'cotonea', meaning quince, and the suffix 'aster', meaning a slight resemblance. The shrubs belong to the apple family, or Rosaceae, and their berries do resemble miniature quinces.

There are many Cotoneaster species which are hardy in the north, but more kinds can be grown in the south and on the west coast. Consult your local nursery or garden center for varieties which will do best in your area. □

A Parney Cotoneaster is an evergreen arching shrub which grows to about eight feet. It has white flowers that are very attractive to honey bees and the red, long-lasting berries are attractive in the fall landscape.

EARTHQUAKE EARTHQUAKE

CHARLES SIMON

Tuesday, Oct. 17, 1989, 5:04 p.m., Santa Cruz, California.

I had just finished finding a number of strong, winter-ready colonies for people, some who had been waiting for over a year. I am not a bee dealer, but good beehives are hard to find, so I gave these people a choice — either get on the list and wait until I "ran across" the right something, or look elsewhere. Several had chosen to wait and I finally had something for them. I headed home to both take a shower and let the waiters know that I would deliver tomorrow. I had to wait for sunset before I could pick up the bees, anyway. I whispered a little prayer that nothing go wrong, please. Of course, I meant something along the line of flat tires or a blown fan belt.

So, at 5:04 p.m. and counting, I was naked as a honey bee and ready to jump in the shower. To locate me a little more precisely — my apartment is three blocks from the downtown mall in Santa Cruz, CA one of the hardest-hit spots. My main apiary is situated in Nicene-Marks State Park, the actual epicenter of that which the locals refer to as "the pretty big one"

At 5:04 it happened. "This is is." I thought. Nothing can survive such a cruel shaking. I danced and ducked as all of my possessions were flung about with satanic intensity. The edge of one of my paintings fell and hit my foot, splitting it open. I crouched next to the dresser, and the fishbowl came flying off, missing my head by a beespace. And then my honey crop came too. Both gallon and quart jars were flying about and crashing on everything and topping them all off with honey and broken glass. It was the longest fifteen seconds in this beekeeper's history. Then it stopped.

I put on my pants and jumped over and around the incredible rubble of my things and made it out the door.

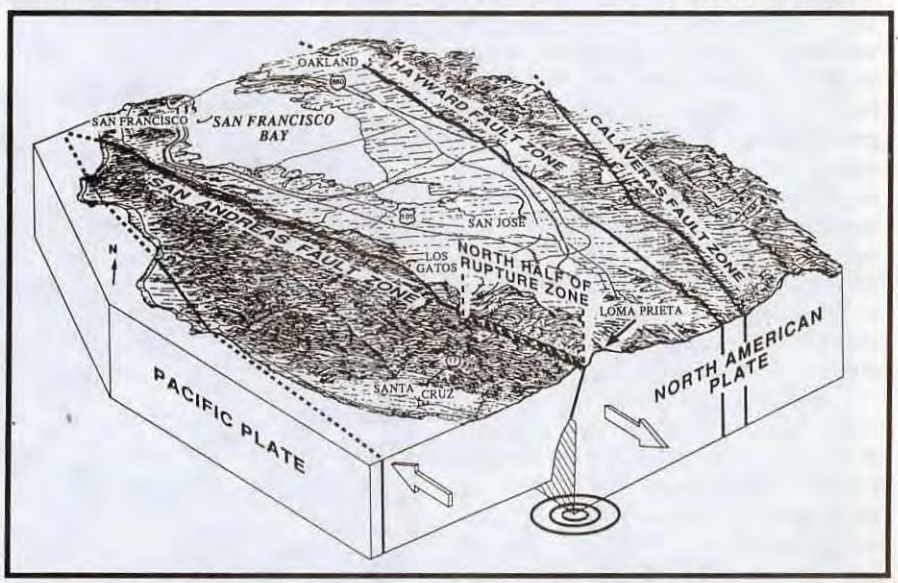
People were screaming "evacuate the neighborhood", because the gas main was broken and it was feared the whole block was going to explode. I could hear the gas hissing and smelled it as I ran to the empty field near the high school. In only minutes I was sitting in the middle of a field along with hundreds of other people. I was a refugee, cut off completely from my life and loved ones and only a few blocks from home. I was no longer a beekeeper or anything else. I was shirtless and barefoot, and it was getting dark and cold.

It may sound like I'm making this up, and I wish I were. But I was there, in the middle of it. I'll pass the details by: the homelessness, the shelters, the salvation army, the red cross, the police, the army, and the hordes of people in shock all wandering aimlessly around the ruins of their town.

I was able to return to my apartment in a few days to address the mess, but many were not so fortunate. Scores of houses and buildings have been condemned, leveled to piles of rubble and already removed.

But, life goes on. The people, myself included, are still in shock. It is hard to go on sometimes. Taking care of business seems futile, silly and petty. The town is now a maze of cyclone fencing. There are familiar, everyday places you can't go to now, even to see the extent of the damage. The traffic jam has become endemic as major arteries are blocked in critical places. This small, seacoast town now has rush-hour gridlock. Heavy equipment is everywhere bulldozers, earthmovers, trucks, the army, camouflaged vehicles, cranes and wrecking balls. And all during the three thousand or so aftershocks, (seventy plus registered 4.0 or better on the Richter scale), we wait for the "big one" that will put an end to all this terror.

I called Ormond Aebi, the local third-generation beekeeper and holder (along with his father, the late Harry Aebi) of the official world's record of the maximum honey production from a single hive with a single queen in one season (Guiness Book of Records holder for 10 years at 404 lbs.). Though his record was finally broken, he is still the Champ. He was okay and his hives,



The Loma Prieta Earthquake. Time: October 17, 1989, 15.24 seconds after 5:04 p.m. (PDT). Magnitude: 7.1. Location: Lat. 37.036° N., long. 121.883° W. Depth 11.5 miles, 9 miles northeast of Santa Cruz, 60 miles south-southeast of San Francisco.

which I was also worried about being as how they are on high stands, had not been overturned. He had some referrals for me to attend to — people with earthquake-related api-problems.

There was a woman in Watsonville, a community hit even harder than Santa Cruz, who reported that her home was being attacked by bees. Was she sure they were bees? Yes, she was sure, and since she was terrified, could I come over as soon as possible?

I found several hundred bees relating mostly to an area of wall directly to the left and two-thirds of the way up the front door. They had the lazy back and forth flight of robbers and scouts, apparently from a colony that had been disrupted and were possibly tuned into a colony that had been in the wall there at one time. Or perhaps they were descendents of that colony and just remembered. I told her that in my opinion if left alone, the bees would disperse on their own; but she should call if she saw more bees developing rather than less. She hasn't called.

When phone service was finally restored I received a call from a man whose chimney had collapsed with a feral colony inside, scattering combs and bees all over the street which, needless to say, was prohibiting access to the premises. I went over and cleaned up the mess, securing the area for civilian occupation again.

Then there was the man whose hives had toppled and given him a good stinging while he was setting the situation to rights. As he was allergic to venom, he was of a mind to give up and asked me if I could come and remove them. It was an ordeal to find the place, what with roadblocks and detours and unfamiliar territory (as familiar territory wasn't even familiar anymore). One picks one's way carefully, driving on tiptoes, so to speak. You can't take it for granted that the road will be there around the bend anymore. And when I finally got there, he told me he'd given the bees to somebody else, apologizing profusely. "no matter" I said, and I meant it. I was lucky to be alive.

Then came a call from a local police department — a full-blown, free-hanging, primary-seeming swarm at the end of October. Luckily, I had plenty of comb to hive it on and, with feeding, it stood a good chance of surviving, possibly thriving. This atypical, out-of-season, traditionally undesirable swarm was no doubt forced to abscond from a broken home.

At one location, a hive which had been standing on a fourteen inch high stand on a terrace cut into a mountainside had been catapulted ten yards and landed upside down without top or bottom. Amazingly, the bees were O.K., adjusting quite well to life upside down — bringing monumental loads of pollen directly into the open top (which used to be the bottom) because the entire bottom (which used to be the top) was flush with, and slightly buried in, the ground. It needed to be turned over and to have its top and bottom replaced.

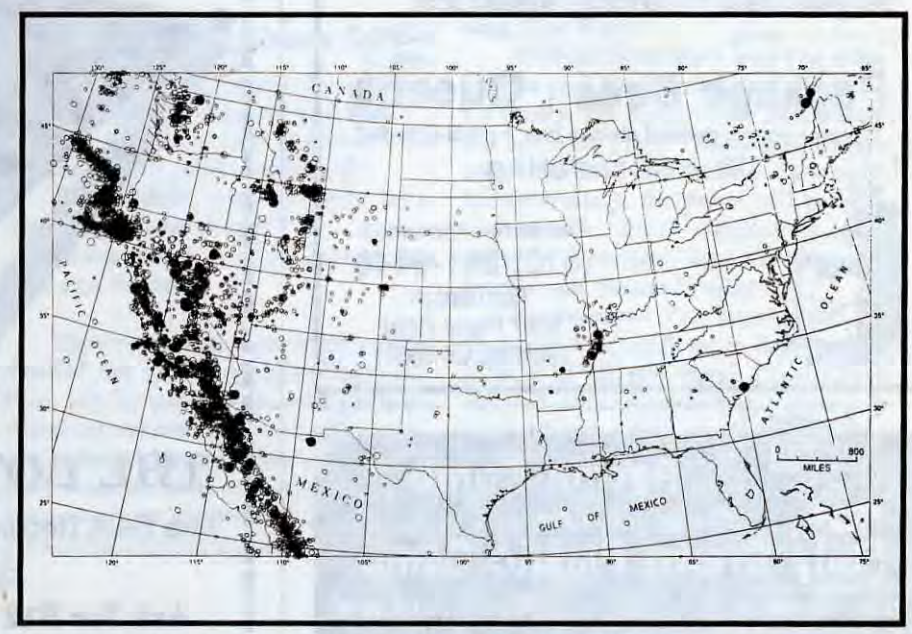
I wore protective gear but used no smoke. Nor had I tied the tops of my high-top Reboks, my preferred footgear for beework (normally worn with tops untied and pants tucked in), usually adequate protection — and comfortable to boot.

It was an emergency, you see, and I suppose I was still in shock. Not only did I turn the hive (composed of four medium-depth supers and full of honey and heavy) over, but I also poured several hundred bees into the lovely funnels formed by the tops of both shoes. Oh yes, I guess I should confess — no socks, this being California. The bees gave my ankles a thorough stinging and crawled up under my suit, stinging me in various other tender places. The upside is I like getting stung.

Ormond reports that his bees began evacuating their hives ten days before the quake. Hundreds of them flew to the ground (his hives are on twelve inch stands) directly in front of the hives and proceeded to march directly east about fifteen yards. There they grouped in lumps, each representing and maintaining colony integrity. Every day the numbers increased and every evening Ormond scooped them up and returned them to their colonies. When the quake occurred there were swarm-sized clusters out on the ground

emergency swarms apparently in case their hives were destroyed. Oddly, the bees I was with during this period exhibited no atypical behavior of any sort, but they were in hives on the ground — not on stands. Perhaps it was because bees on stands experienced an amplification of vibrations that they behaved in this manner.

Despite the fact that Ormond's hives did not fall, he was thrown to the ground in front of them and spent the enitre quake praying they wouldn't topple (and especially not on him). I have concluded that when beekeeping in earthquake country it might be best to forego stands. □



Although earthquakes are most common in California and Alaska, they have shaken all States. Earthquakes as large or larger than the Loma Prieta event have occurred in Alaska, California, Hawaii, Idaho, Missouri/Tennessee, Montana, Nevada, South Carolina, Washington and in Quebec, just north of Maine. Also, prehistorical evidence indicates that events of this size have occurred in Oregon, Washington and Utah. This map shows the locations of all historical earthquakes of magnitude 5.5 or larger (largest circles) and all earthquakes of 5 to 5.4 (smaller circles) since 1925, all recorded earthquakes of 4 to 4.9 since 1962 (still smaller circles) and all recorded earthquakes of 3.5 to 3.9 since 1975 (smallest circles). Clearly, earthquakes are a nationwide problem.

INNER ...Cont. from Page 68

garding speakers for each topic. This same group would also decide dates, location, etc. The two National groups work well together in other areas of business, and even politics, so there's no reason to suspect they wouldn't work together here as well.

Next, each group would submit their closed meeting schedules so these too could be planned. When all the necessary inputs have been made the planner puts the whole thing together, handling all the details including reservations, scheduling, registration, promotion — everything.

I realize this may sound rather simplistic, but the savings in time and energy alone would be monumental. Plus the powers that be in each group could actually lead their respective sessions and enjoy the show rather than worry where the coffee is for the next break.

So, who would handle this potential double suicide? There are professional meeting planners that do this for a living, and for the most part they work pretty well. The downside is that you have to train them in what's important and what's not, and who shouldn't sit next to whom on the stage. But these are petty problems that are easily solved.

Actually, for many industries this sort of event is an annual time and money saving deal. Groups with similar backgrounds but different politics hold joint informational sessions, and then breakout for their individual tribal rites. The Commercial Landscape industry and the Greenhouse business are only two commodity groups with similar backgrounds but internal political splinter groups.

Another third party often employed for this sort of thing is an unbiased industry information source — a magazine that serves the folks who both plan and attend the meeting. This primarily because they have an objective overall view of the industry they serve, and the differences between the two (or more) groups sponsoring the meeting. And yes, we will discuss just such an event, but that's for another time.

But all this aside, the underlying problem here is that these two groups *must* isolate their political and personal differences and see the bigger picture. The American beekeeping industry can no longer afford this double expense, and the time for it to end is at hand.

•

Who are honey bees for?

The beekeeper, who makes a living from the harvest of honey and wax?

The growers of food and fiber who pay for perfect pollen exchange?

The wildlife, who certainly take the honey bee seriously?

Or the rest of us, who just enjoy the time and the bees?

The answer to that question will be decided not by biologists or businessmen, but by politicians. And political decisions are made by pull and financial support. Rumors that either common sense or need ever play a role in these matters are strictly unfounded. So who has enough of these to get honey bees in their corner?

Well, the wildlife pack won't make more than a molehill out of this mountain. The powerful lobbies like Audoubon, Natural Wildlife Fund and the rest have already picked their fights and they need all the money they can get to pay for the fund raising they're always engaged in. Nobody will make a claim here.

But the food and fiber folk have a good grasp on those responsible for the act of pollen transfer. Their pull has already been felt in Maine and Massachusetts, and this spring there will be power plays for those small white boxes on great big trucks like no time in history. Just watch.

Without bees there won't be cranberries and blueberries, and more importantly, the money that comes from the taxes they pay. That ought to scare some common sense into somebody. Unfortunately, the panic will be local and specific. State regulations (each different and sillier than the next) will be the rule. Sound familiar?

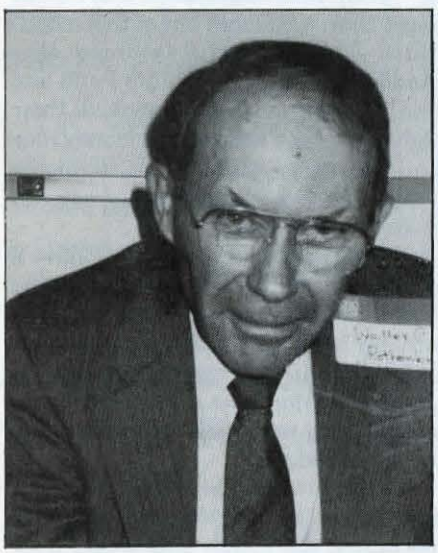
Beekeepers? The super-sized operations who spill more honey than most of us will ever make already have the pull and the power to get what they need (if not what exactly what they want). Most of the mid-sized fall in line and take what's offered, and just make the big, bigger. Always been that way, and always will, and that makes sense.

But if it's numbers you're looking for, there's no larger group than those wild and crazy hobbyists. United, all 200,000 of us could probably make some noise, exert some power, and even give some support. But probably not. We're too wild, too crazy, too stubborn and usually too busy — taking care of bees.

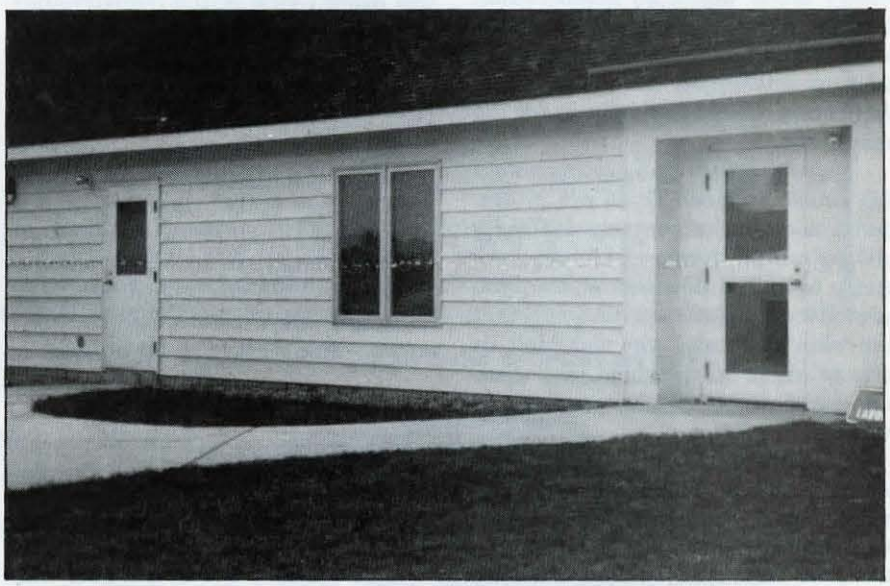
Kim Flottum

Rothenbuhler Lab Dedicated

KIM FLOTTUM

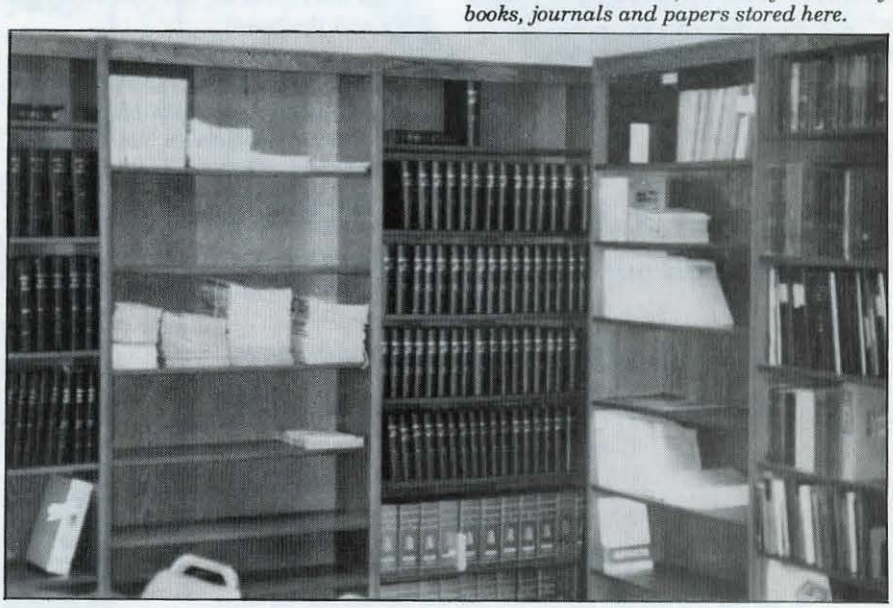


Dr. Walter Rothenbuhler, Professor of Entomology, Ohio State University (Retired).



The main entrance to the new lab. Inside are two laboratories, a conference and library room, offices, storage and unloading areas.

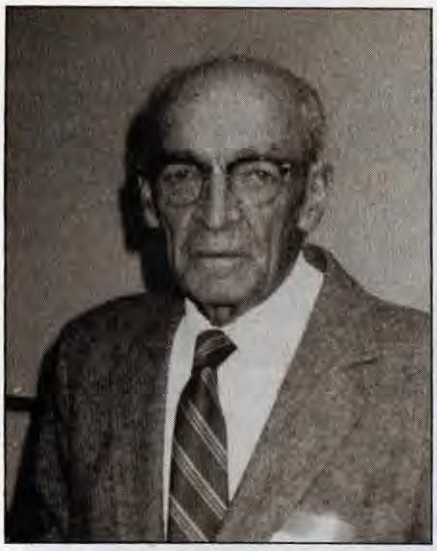
A partial view of the conference room, where students can browse, or study the many books, journals and papers stored here.



On October 10, 1989, the Ohio State University officially dedicated the Walter C. Rothenbuhler Honey Bee Biology Laboratory in Columbus, OH. Only the second building in the world named after a faculty honey bee Entomologist in the world, the laboratory is at the cutting edge of facility capability in apiculture research.

Dr. Walter Rothenbuhler, who retired in 1985, started working on acquiring funds and support for this building in 1976. His laboratory at the time was a (somewhat) remodeled house on university property.

"It was always drafty in the winter", he said, "and we all froze for six months. Of course, it was just the opposite in the summer when we all cooked," he added.



Hobart Fulton, an untiring and dedicated supporter of the research program at Ohio State.

The new building has two laboratory rooms, a library conference room, a classroom, a workshop storage area and an enclosed loading dock. It sits across campus from the old lab, near a dairy center and research orchard. A small outbuilding is nearby, which for years held extra equipment. There is also a small enclosed bee yard adjacent to the new lab, and several other yards close by.

Dr. Rothenbuhler was an apiculture researcher for 23 years, during which he oversaw the work of 23 masters students and 13 PhD graduates. He also had four postdoctoral students during his tenure.

The Ohio State Beekeeper's Association was also instrumental in obtaining funding, and convincing faculty, deans, chancellors and even legislators of the necessity of the lab.

Hobart Fulton was one of the OSBA members who persisted in the chase for funds, and attended the dedication.

"This took a lot of convincing", he said, "but isn't this the ideal set-up for a bee researcher?", he added.

"The sky's the limit on what can be accomplished here," he said with a smile. □

BEEKEEPERS MEETING

STRIKE ONE!

JAMES DOONAN

For 10 years I'd had as many as four colonies under that big oak tree, which always shaded them in the afternoon. The location was on a farm about five miles from my home in Heber Springs, Arkansas.

It was on the afternoon of September 5, 1989, near the end of our dry season when hit or miss storms often pop up in the heat of the day. That's when it happened. I could see the frequent flashes of lightning and hear the rolling thunder. From the direction and nearness of the storm I pretty well knew that the farm, and my bees, were getting rain. But I had no idea how severe the storm was until six days later, when a friend and I drove out to check them.

That year I had only three hives under the tree — the rest were down a small hill in full sun. As we drove up it was clear something had happened. Where hive #3 had been there was only a scattered pile of torn up equipment — frames, combs and all the rest.

I first thought that a bear must have visited the apiary, but on second thought realized a bear wouldn't have quit after destroying only one hive. Furthermore, the frames and combs would have been more scattered.

I summoned the farmer and his son, who as yet were unaware of the tragedy, and they told about the severe electrical storm on the fifth which had caused some damage in, and near, their house. On the trunk of the oak tree nearest the hives there was a slight split, though it wasn't readily apparent. There seems to be some controversy as to whether lightning strikes from the top and goes down, or begins at ground level and travels up. Frankly, I don't know and I don't care to do any close-up research!

But back to the disaster. I didn't have a camera available and it was quite late in the afternoon, so I came back the next morning and took a few pictures. The editor of a country paper sent a photographer, and his picture made the front page of the *Arkansas Sun*.

Hive #3 had two deep hive bodies and four shallow supers. The only pieces which escaped damage were the inner cover and a plastic telescoping cover. The bottom board was blown completely apart. The dove-tailed supers had been both glued and nailed together. I couldn't have taken them apart with a hammer. However, the explosion managed it and with a minimum of damage to the wood. Only one shallow had an end piece split in two, but two shallow ends, which were blown well beyond the tree, were concealed by vines on the ground and weren't found for awhile.

I spent several hours pulling nails and scraping propolis from the pieces. By gluing and renailing I had the two deeps, and three of the shallows ready to paint. Empty equipment (used) is not all that valuable, but install bees in it, and it becomes valuable to me, as well as to all mankind. That will have to be spring though. As for the frames and combs from old #3 — they were so blackened by the explosion and exposure to the weather I removed them from the apiary and burned them — a very hot fire!

People ask me..."Did it kill all the bees, and what about the queen?" The latter I can't answer, but even if she lived she no longer had a home and no Welcome Mat next door. There were some dead bees in the combs, but no pile of dead bees were found. However, there was a tremendous population

The results of one unlucky strike. Sun Photo.

increase in the adjoining hive. I don't believe the sudden influx of company was welcome because the bees in both remaining hives became very cross. The bee inspector said, "I'm putting on my gloves for only the third time this year!"

I've been working with bees for some 40 years — and was born on a farm where my father and grandfather had bees, but this is the first time ever that I saw a beehive destroyed by lightning! However, I was glad it was only a beehive and not my house. I've heard that a single bolt of lightning carries enough power to light the city of New York — True?

Unfortunately, lightning or no, my mortal enemy — the poison ivy vine, as fresh as ever — continues to climb that oak tree, probably good for another 10 years. □

QUESTIONS? ANSWERS!

Clean Up Crew

Q. One of my colonies starved over the winter, and the combs are filled with dead bees. If I put those combs over another colony, will those bees clean out the dead bees?

Maryanne Tricomy
Cape May, NJ

A. Yes. There are various ways to deal with those combs. Scrape away the dead bees that are not stuck in cells, let the combs dry out by putting the dead hive in a sunny spot for a few days, then (1) set the hive body, containing combs and dead bees, on a strong colony, and the bees will finish the job for you; or (2) just hive a good-sized swarm in that dead hive, and the swarm will clean the combs out; or (3) having followed the first suggestion, wait until there is brood in those combs, then move that hive body, combs, brood and bees to a new stand, making sure you leave the queen behind with the original colony, and give this new colony a new queen. Do not have them raise a new queen, for a queen raised under these conditions will be of poor quality.

Syrup Time

Q. I have 300 gallons of corn syrup which I want to feed to my bees. What additives should I use?

William Deveaney
McDonald, PA

A. I do not recommend feeding bees at all, but that is not the question you raised. There are two kinds of corn syrup, only one of which, the isomerized kind, is fit for feeding bees. There is, in my view, no need for any additive.

Botulism

Q. A friend saw a sign in his doctor's warning not to feed honey to infants the first year. How come?

Dick Feldman
Berthoud, CO

A. This question has arisen before. The same sign appears in our pediatrician's office. It seems the spores of botulism can survive in honey. I personally believe that the danger is slight, and in any case, there is no danger in giving children honey after the first year (see insurance article, this issue).

Ant Traps

Q. I produce comb honey, and my work is done in the basement, where there are tiny ants, winter and summer, that crawl up the table legs and get into the honey, What can I do?

Joe Watkins
Columbus, OH

A. I had a similar problem, but with big ants. I solved it by stacking my supers on wooden trays, on which were mounted four casters, and I set the casters in little pans of kerosene. You might set your table legs in pans of kerosene. There used to be sold little ant buttons, from which ants would carry an ant poison back to the nest, but these are, strangely, no longer legal. The ant buttons now sold are worthless.

One, or More

Q. What are the advantages of a double- vs. a single-story hive? Does the double-hive produce more bees? Does the type of honey production have anything to do with it? Or geographical location? Does hive size affect swarming?

W. S.
Montclair, NJ

A. Large, two-story hives are standard for commercial extracted honey production in the north, for many reasons. All combs are interchangeable. New colonies can be created by simple division. But the main reason is that the bees are likely to have more honey in the hive when winter comes. Comb honey beekeepers usually use a smaller hive, sometimes only a single-story. I consider a one-and-a-half-story hive. That is, one consisting of one full-depth hive body and one shallow extracting super, best for comb honey production, provided it is very heavy with honey when winter comes.

Black Locust A-Buzzin'

Q. A friend has about an acre of black locust trees a mile away. I plan to move some bees to that grove this spring, and also to shook swarm some colonies in my home yard and move the shook swarms to the grove. The black locust blooms here around May 20. When would be the best time to move bees and shook swarms to the grove?

Joe Cerwonka
Westminster, MD

A. First, black locust is a fickle nectar source. Even under the best conditions flows from this source are unreliable. Second, bees require a considerable time — a couple of weeks, I would guess — to become sufficiently oriented to a new area to gather nectar efficiently. Third, while bees prefer to forage within a quarter mile of the hive when they can, one mile is not an excessive distance for them to travel for a truly bountiful source. Hence, I would suggest leaving all the shook swarms in the home yard where they can easily be reunited at the end of the season, and any movement of colonies to the locust grove should be done as early as feasible in the spring. But do not count on getting any honey from that grove.

New Nucs

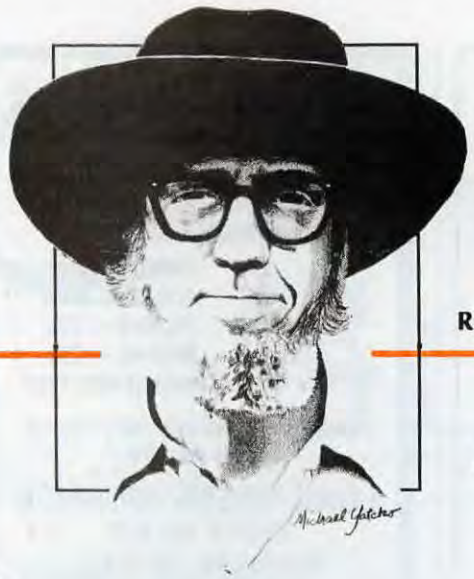
Q. What is a nuc?

Jim Gearhart
Neuada, OH

A. A very small colony of bees or nucleus colony that usually contains three to five combs and is kept in a hive of reduced size, is called a "nuc box"

(Questions and comments are welcomed. Address: Dr. Richard Taylor, 9374 Rt. 89, Trumansburg, NY 14886, enclosing U.S. or Canadian stamp for response.)

Richard Taylor



BEE TALK

RICHARD TAYLOR

9374 Route 89, Trumansburg, NY 14886

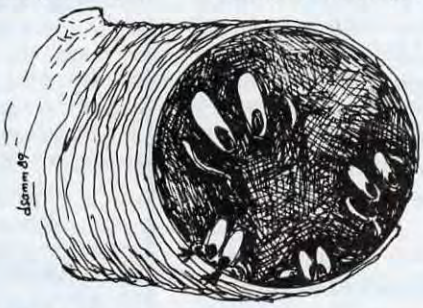
"I've learned much about mites and it's not all bad."

I recently attended a conference, extending over two days, on tracheal and Varroa mites. It attracted both commercial and sideline beekeepers, some from considerable distances. There was some disagreement, even among the experts, on the role these pests are going to play in apiculture, and I shall not attempt a summary of what I heard there. Instead, I am going to set forth, for whatever it may be worth, the conclusions I have arrived at, from this and other sources. I did not come away from this conference rejoicing, for there is no doubt that the impact of these mites is going to increase over the years just ahead. I am convinced, however, that the problems they pose are manageable and will in time be overcome, eventually by developing resistant strains of bees.

Tracheal mites are by now familiar to many, perhaps most, beekeepers, and concerning these I can to some extent speak from personal experience, having lost colonies to them last spring. Roger Morse has imported from England and Scotland queen bees from what appear to be resistant strains. The queens raised from these will, as I understand it, be supplied to regular queen breeders, to produce many thousands of new queens, which will then be distributed to beekeepers to test comparative results. This is, I think, the direction to go, and I am optimistic about the outcome, although results will not, of course, be immediate. Meanwhile many commercial beekeepers are relying on menthol treatment, and I have very grave misgivings about this. My main fear is contamination of honey, for even though menthol is a natural substance, its discovery in honey could be an overwhelming setback to beekeepers.

I raised at the conference the question whether tracheal mites could not be controlled by good management, and my question was referred to an entomologist — or more precisely, an acarologist. He thought I was asking whether they might be controlled by extensive feeding of sugar syrup! And that is about the farthest thing from what I had in mind.

By proper management I mean keeping colonies strong *all the time*, through winter and spring as well as during honey flows. Infections of honey bee colonies, no less than of human beings, are a function not only of invading organisms, but of resistance. A colony that is strong and not under stress does, to some extent, resist the destructive power of tracheal mites. This I know from experience last year with these mites. And I got my biggest honey crop ever. The colonies that had perished from tracheal mites were restored early in the season by taking combs of brood and bees from surviving strong colonies, swapping them with empty combs from the dead colonies, and requeening. Since there was a strength there to begin with, all the colonies built up rapidly and in time for the flows. That is what I mean by management. I fed no sugar syrup at all.



Varroa mites are going to be another story. These are being continually discovered in places where they were hitherto unknown, and there is little doubt that they will in time be ubiquitous. There is no possibility whatever of eradicating them, or of preventing their spread. I am also told, by those who know, that once they are found in an apiary, then it will soon be discovered that every colony in that apiary has them. Left alone, it is only a matter of time — a few years at most — before even the strongest colony succumbs to them.

Here there seems to be little doubt that the development of resistant strains will be the ultimate solution. Such strains already exist. In Brazil virtually every colony has Varroa mites — and yet beekeepers there consider them only a minor problem, of such little significance that they do not even attempt to control them. The bees themselves keep them in check. But of course the other side to this encouraging fact is that the bees that have this resistance are the Africanized ones! Not many people are going to welcome the spread of Africanized bees on this continent, and I personally believe they are never going to become established in our northern latitudes anyway. But the fact that they do effectively resist Varroa mites is enough to prove there are resistant strains, and there is no reason why these cannot be developed so that, in time, we can have resistant bees without getting, in the

bargain, the less desirable traits of Africanized bees. So there is, it seems to me, a very promising future for knowledgeable queen breeders, especially in the north.

In the meantime, the most promising control substance appears to be Amitraz. Special very precise measures applicable to apiculture are being developed, through careful research, by one of the manufacturers of pesticides. Soon, I believe, there will be made available thin plastic strips impregnated with minute quantities of Amitraz, which can be inserted between the combs of the brood nest in the fall, after brood rearing has ceased and after the honey crop has been harvested. The effect is to incapacitate adult mites still in the hives, without necessarily killing them, so that the bees can then dispose of them. But this must be done in the fall, when the colony is broodless, since the early stages of the mite parasitize bee larvae and are not affected by this treatment. This will make its use difficult in the south.

Here again, though, the overwhelming danger is the potential for contaminating honey. Imagine this scenario: Someone discovers that massive doses of Amitraz can cause cancer in mice. Then someone else discovers a minute trace of Amitraz in a honey sample. Then a journalist puts these two things together. Next appears the headline, "Honey Linked to Cancer!" Many generations of beekeepers would come and go before they could overcome something like that. LET US NOT LET IT HAPPEN. If you are going to introduce *any* artificial substance into a colony of bees, then bend over backwards with care to make certain that not the tiniest trace even gets near any honey.

People have been keeping bees since antiquity. And bees will be kept as long as civilization lasts. That future can be a bright one, but only if each of us exercises the most exquisite care. It would not take much to ruin things. □

(Questions and comments are welcomed. Use Trumansburg address and enclose a U.S. or Canadian stamp for a prompt response.)

GLEANINGS GLOBE

FEBRUARY, 1990 ALL THE NEWS THAT FITS

But Down 17% in U.S.

WORLD HONEY PRODUCTION UP 1% IN '89

Honey production for 1989 in selected major producing countries is forecast at 696,530 tons, up 1% from the revised 1988 harvest of 687,255 tons. These countries produce approximately 2/3 of the world's total.

Canadian production for 1989, forecast at 31,500 tons, is down 14% from last year reflecting poorer climatic and field crop conditions. The three Prairie Provinces, which account for about 60% of Canadian honey production, hive yields are expected to be down sharply from the 1988 levels despite a hot, sunny and dry summer that is normally conducive to high yields. Reasons for the decline center on reduced plantings of optimum bee forage such as canola. In addition, low soil moisture levels caused plant stress during the important bloom period and reduced nectar yields. Most prairie producers reported a generally lower rate of bee activity in 1989 compared to last year.

México's honey outturn for 1989 is forecast at 52,530 tons, 14% more than the previous year, because of favorable weather in the main producing states. Normal rains in the main producing state of Yucatan provided abundant wild flowering before and during the peak of honey flow. Citrus fruit is the predominate flowering source in Neuvo Leon, Tunalipas and Vera Cruz, while there are many flower varieties in the central and southern states. Honey output is expected to decline in the foreseeable future because many part-time producers use poor management practices, lack economic resources and cannot control the progressive Africanization of their hives.

U.S. 1989 honey output is expected to total 80,000 tons, down 17% from last year. The lack of available flora in the key producing state of North Dakota was the principal reason for the decline.

In the Soviet Union, the world's largest honey producer, honey production for 1989 is forecast at 225,000 tons, up 5,000 tons from the 1988 crop. The favorable forecast is a reflection of an increase in the number of colonies in the private sector and improvements in management.

China, the second largest producer in the world, is expecting a honey crop of 180,000 tons in 1989 — 24,000 tons more than last year's revised estimate, but 24,000 tons below the bumper 1987 crop. Although Chinese officials expect honey production to increase, most of the increases are expected to occur from expanding the number of colonies as opposed to improving yields.

"News is the first rough draft of history."
Ben Bradlee

About Time!

BEE BREEDERS PUBLISH

The California Bee Breeders, Inc. announce the new publication of a newsletter entitled *The Bee Breeder* in January.

"Because they want better communication between members, and within the industry, the newsletter will keep you informed on current events, research developments and market trends", says Sue Cobey, Editor.

For information on subscribing or advertising contact *The Bee Breeder*, 6745 Buckton Lane, Vacaville, CA 95688 or call 707-447-6723.

NORTH CAROLINA GETS NEW GROUP

A new chapter of the NC State Beekeepers Association was recently organized in western North Carolina. This new chapter is named the Tri-County Beekeepers and is made up of Cherokee, Clay and Graham counties. The president is Bass Hyatt, Jr. of Rt. 1, Brasstown, NC 28902. For more information on this new association contact the chapter secretary/treasurer: Mr. Allen Caldwell, Agric. Ext. Agent, Cherokee Agric. Ext. Office, 115 Peachtree Street; Suite 103, Murphy, NC 28906, Phone: 704-837-2210.

Grasshoppers In Trouble

A fungus from Australia is showing great promise as a possible natural weapon to control range and crop devastations by grasshoppers. According to Jerry Fowler, director of USDA's Grasshopper Integrated Pest Management project, said tests with the fungus indicate it can infect and kill a broad range of grasshoppers. "We believe this fungus could play an important part in an integrated approach to grasshopper control," he says.

Check The Dates

Calendar Available

Years ago the NC Beekeepers Association began the tradition of producing an annual beekeeping calendar and the tradition continues for 1990. Distribution of the beekeeping calendars has been made to NCSBA members and a limited number are available for sale to non-members.

This attractive and professional wall calendar measures 11" by 17" when opened and the pages have room for notes, appointments, and other day to day activities. But in addition, each page of the calendar contains a wealth of information of special interest to beekeepers throughout the United States with special emphasis on the mid-eastern states around North Carolina.

This includes blooming dates of nectar and pollen sources, honey recipes, selected topics such as a tribute to Brother Adam, Classic Bee Patents, Bringing Bees to America and children's bee poems. In addition, it contains the meeting dates for many of the national and regional beekeeping organizations.

Individual copies sell for $4.00/copy, or $3.00/copy, 10 or more.

Also, pay $8.00 1990 dues you'll receive 1990 calendar plus a free 1991 calendar. Make checks to NCSBA and mail to the NC State Beekeepers Association, 1403 Varsity Drive, Raleigh, NC 27606.

Egypt May Be First

WORLD WATER RUNNING OUT

The world is growing increasingly reliant on irrigated agriculture for its food. Irrigated lands, which account for only 17% of the area under cultivation, today yield one-third of the global harvest, notes Sandra Postel, a senior researcher with the Worldwatch Institute in Washington, D.C. Through most of the 20th century, per-capita irrigated agriculture expanded faster than world population. But that trend peaked in 1978, and in the years since, the global per-capita acreage devoted to irrigated agriculture has dropped by 6%. Moreover, a number of factors seem likely to hold or further depress the per-capita irrigated average, jeopardizing world food supplies in the coming decade, Postel reported in a study released in December.

The search for affordable water is prompting farmers from Texas to China to overpump groundwater at nonsustainable rates, she says. In the rich fruit-and-vegetable basket of Soviet Central Asia, farmers have diverted so much water that the surface area of the Aral Sea — the world's fourth-largest lake — has shrunk by 40% since 1960. And throughout the world, cities are diverting irrigation water to slake the thirst of their growing masses. Postel says she suspects the water crisis will come to a head first in Egypt, where water supplies just barely meet demands and a population of 55 million is growing by another million every eight months.

To cope, she recommends governments consider: reducing water subsidies, which discourage conservation of this limited resource; parcel out irrigation water conservatively; targeting more funds toward boosting crop yields on rain-fed lands; and limiting population growth to slow growing demand for globe's tightening water supplies.

Grant for Research

PA STRIKES MITES

"In a survey of Pennsylvania beekeepers and honey bee colonies, we found widespread evidence of tracheal mite infestation," says Dr. Edwin G. Rajotte, assist. professor of entomology.

The mite is a threat to honey production and pollination of crops nationwide, because it debilitates and eventually kills the bees it infests. The value of the crops pollinated by honey bees is extensive, and in 1985, the value of increased yield and quality achieved through pollination by honey bees alone amounted to nearly $9.3 billion.

In Pennsylvania, there are approximately 8,000 registered beekeepers and about 75,000 honey bee colonies, Entomology instructor and project associate Maryann Tomasko notes. The industry produced $1.4 million worth of honey in 1988, and it also provided pollination services for a wide variety of fruits and crops in Pennsylvania and elsewhere. Approximately 6,000 Pennsylvania honey bee colonies are used for pollination purposes and honey production outside the state, she adds.

Honey bees are critical to Pennsylvania's apple industry in particular, said Dr. Rajotte, another project associate and associate professor. Pennsylvania ranks fifth nationally in apple production.

To ensure the survival of the state's honey bee industry, the researchers are completing a survey of tracheal mite infestations, funded by a $46,000 grant from the Pennsylvania Department of Agriculture and continuing their research with an additional $50,000 grant from PDA.

The new project runs through Dec. 30,1990, and involves developing an efficient method for determining the infestation rate and an effective treatment delivery system. The information will be incorporated into a computerized expert system called "Bee Aware" to assist beekeepers.

Current methods for detecting the presence of mites are time-consuming, involving the dissection of many bees and a lengthy laboratory procedure. Since the mites spread rapidly, quick diagnosis is essential to save a colony, Tomasko says.

Rajotte adds, "When our research is complete, we will have a very specialized system that offers advice on discovering mites, sizing up the rate of infestation and managing the pest."

Nutra-Sweet Wants More

NutraSweet Co. is trying to woo diehard sugar eaters with its test of Sugar Delight a tabletop sweetener that's 99% sugar and 1% NutraSweet.

"We're going after the sugar user who needs to cut back," said a NutraSweet Co. spokesman.

Sugar Delight is sold in packets and marketed as "light cane sugar." One serving of Sugar Delight has 8 calories, compared with 16 calories in sugar.

Unlike NutraSweet Co.'s Equal, a powdered tabletop sweetener, Sugar Delight mimics the granulated form of sugar.

The product is testing in about 22% of the country, including parts of Florida, Ohio, western Pennsylvania and Texas, plus the metropolitan areas of Kansas City; Portland, Ore; and Seattle.

The test has received spot TV and direct-mail support, as well as free standing inserts, in-store promotions and public relations blitzes.

Only 90 In The Society

MORSE NAMED ENTOM. FELLOW

The Entomological Society of America has named Dr. Roger Morse, Cornell University, as a fellow in the Society. There are currently only 90 Fellows in the 9,000 group.

Roger Morse, professor of entomology at Cornell University in Ithaca, NY, graduated from Cornell, earning a BS in 1950, an MS in 1953, and a PhD in 1955.

Dr. Roger Morse

His responsibilities include all extension, teaching, and some research regarding apiculture at Cornell. According to one colleague, "Roger Morse is one of the world's foremost apiculturists. What Morse does better than any other bee scientist that I know is keep current on the results of basic research on honey bees and make this information available to beekeepers and others involved with bees. In this regard, he has played a central role in helping the bee industry in the United States cope over the years with the various problems of bee predators and diseases, overproduction of honey, swarming and wintering, introducing queens into colonies, and most recently, the impending invasion by the African honey bee. His tools of trade include his numerous books on beekeeping, his monthly column (Research Review) in the principal trade magazine for beekeepers, and his extension program within New York state.

Besides serving as a major link between basic and applied aspects to honey bee biology, Roger Morse has played a remarkable role in training a generation of PhD's in apiculture in the Untied States. Easily more than 50% of the professors of apiculture were graduate students under Morse, and as far as I know, all are considered truly successful. Morse's style of supervising graduate students is one of giving maximum financial and logistical support, total freedom in choice of thesis topic, and a lively laboratory group in which to develop research skills. The result is a lineage of students that developed from an early stage the invaluable habit of independent thinking."

Dr. Morse's most current works — *Honey Bee Pests, Predators and Diseaseas,* 2nd Edition; and *The ABC & XYZ of Bee Culture*, where he served as Editor, will both be published this year.

Some Good, Some Not

PRESIDENT PROPOSES NEW PESTICIDE LAWS

Essentially, the proposal would modify two existing laws that regulate the use of pesticides — the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug, and Cosmetic Act (FFDCA).

- The first key aspect of the president's proposal is that it would significantly increase the amount of cooperation among EPA, USDA, FDA, and the president's administration when making any regulatory decisions affecting pesticides. EPA would be required to consult with the other agencies before issuing either a suspension or cancellation order.
- It would provide EPA with greater flexibility to use its suspension authority. This was done by changing the definition of "imminent hazard" in two key ways.

First, if the agency identifies a pesticide that has a high risk factor and there is a great deal of certainty about that risk, EPA can order a suspension with no consideration of economic benefits.

However, if the risk associated with the use of a pesticide is slightly less high, or if the risk is relatively uncertain, EPA must take economic benefits into account before ordering a suspension.

- Third, the plan would streamline the pesticide cancellation process so that chemicals which are considered "imminent hazards" can be removed from the

Continued on Page 120

Pesticides, (Continued from Page 119)

market more quickly. To speed the process, the plan will eliminate the formal hearing prior to cancellation that is required under current law, and will replace it with a notice and comment period that takes significantly less time.

An important feature of this provision is that it would allow EPA to place a pesticide under "temporary termination (suspension)" so that it could not legally be used while the agency was making its final regulatory decision.

- Registrants would be legally required to reregister pesticides every nine years to help ensure that registrations are kept up-to-date and meet the latest scientific standards.
- National uniformity of pesticide tolerances that have been set as a result of EPA's review under FIFRA (1988 amendments) would be mandated by law. To establish more stringent tolerances, states would have to prove to EPA that their citizens might be exposed to higher levels of a particular chemical than the national average — perhaps because of groundwater contamination or unusual food consumption patterns.
- EPA's enforcement authority under FIFRA would be strengthened by providing tougher penalties for violators (up to $25,000 per day) and increased record keeping requirements by growers and other users of pesticides.
- Finally, the plan would eliminate the long-standing conflict between regulations for raw products and processed foods by establishing a uniform negligible risk standard that would be applied to all food products. This would eliminate the Delaney Clause currently in place that makes it illegal to use any carcinogenic pesticide in processed food. Theoretically, this negligible risk range would lie somewhere between a risk of 1 in 100,000 and 1 in 1 million.

So Must Food Producers

CONSUMERS CHANGE

American consumers are causing dramatic changes in the U.S. food system, according to an agricultural economist at the Univ. of Minn. Dr. Benjamin Senauer says that four major consumer trends will have major implications for farmers, processors, distributors and retailers.

"Agriculture must shift from an approach of raising what grows best, or which has the most government perks, to producing what sells best," says Dr. Senauer. He says the consumer trends include the following:

- Demographic changes declining population growth rate, which the Census Bureau projects will become negative within the next 50 years and an aging U.S. population demanding food with high nutrition and special qualities, such as low-sodium and low-fat contents.
- Working women — demanding convenience.
- Eating patterns — where family members don't eat dinner together and family members are increasingly deciding what to eat on an individual basis. The implications of these trends for growers are clear, according to Senauer, as consumers search for high-quality food that is convenient, safe and nutritious.

"Agriculture needs to shift from raising what grows best or has the most government perks, to producing what sells best!"

The four trends, Senauer argues, are already causing many changes in food processing and retailing and will have ultimate effects on U.S. farms. Processors will increasingly demand uniform products of dependable quality, and those demands will result in more production contracting with producers. Consumers and, in turn, processors will reflect their concerns for safety in the market place.

Honey Board Highlights

The National Honey Board will launch its new "It's Time for Honey" advertising campaign this winter. Two full-page, full-color advertisements will appear in *Better Homes and Gardens*, *Ladies Home Journal* and *Woman's Day*, reaching over 70 million consumers.

These innovative ads are designed to capture reader attention through the use of unusual visual situations. The fun, contemporary ads feature honey as a treat for today's busy and often harried consumer. One ad shows a mother who needs a honey break from five rambunctious children. The other portrays a woman receiving a traffic ticket — "Thank goodness there's something nice right around the corner."

The ads will also focus on the honey bear logo, which can be used on packages of honey-enhanced food products that meet the Honey Board's standards for honey usage. In conjunction with the ads, *Woman's Day* will sponsor a national "It's Time for Honey" recipe contest, to be announced in February.

This winter, and throughout 1990, the National Honey Board will be letting your customers know — It's Time for Honey!

The National Honey Board will be letting your customers know that "It's Time for Honey" with full-color advertisements in the February issues of *Better Home and Gardens* and *Woman's Day* and the March issue of *Ladies Home Journal*. The ads will also run in the fall issues of these magazines.

Cheryl Ann Iler is the 1989 Iowa Honey Queen, and is the first young woman to represent Iowa in many decades. She will be attending the American Federation convention in Las Vegas as a contestant in the American Honey Queen competition.

She attends the University of Iowa at Iowa City, majoring in Theater Arts.

Tami Gorsuch is the 1989-90 Ohio Honey Queen. She currently attends the University of Cincinnati, and has participated in the Lebanon Honey Festival and other fairs and festivals in Ohio.

The NJ Beekeepers Association's 1990 Honey Queen is Wendy Tetlow. She is a member of Student Council, has been in two school plays and plays the flute. Nights and weekends she works at a local Food Market in Culvers Lake.

Wendy will inform the public of the importance of the honey bee to the pollination of New Jersey's extensive agriculture industry.

Research Boon!

DATABASE AVAILABLE

The Institute for Scientific Information® (ISI) has announced a new multidisciplinary current awareness product called FOCUS ON: GLOBAL CHANGE.

International in scope and also on diskette, this biweekly research tool provides bibliographic information from thousands of scientific and social science journals, as well as from the business and popular environmental press. It is the only available source for this information.

FOCUS ON: GLOBAL CHANGE is scheduled to begin publication this month. Each issue will cover:

- Current research on the physical, chemical and biological processes that affect the earth as a system
- Public policy developments, proposed and existing governmental regulations, legal issues, public health issues, and other social, economic, and political factors that are affected by global change

According to ISI Executive VP Bonnie Lawlor, the purpose of this unique cross-disciplinary approach is to "foster a dialogue among scientists working on similar problems from diverse perspectives and between the people who do baseline scientific research and those who build models and formulate policy based on this work.

FOCUS ON: GLOBAL CHANGE is designed primarily for scientists, research administrators, product planners, marketing researchers, policy formulators, funding decision makers, and environmental activists.

Available on diskette for IBM PC and compatible, Macintosh, and NEC computers, it permits researchers to:

- Search article information from thousands of publications in a matter of minutes
- Browse by discipline at one's own speed
- Create custom search profiles and save them for use during future sessions
- Print out findings
- Export search results to personal databases or to other software programs
- Generate orders for articles from the Genuine Article®, ISI's high-speed document delivery service, or from the author.

Potential subscribers can arrange to examine FOCUS ON: GLOBAL CHANGE on a risk-free trial-review basis by contacting: Institute for Scientific Information, 3501 Market Street, Philadelphia, PA 19104. Telephone: 1-800-336-4474 or, from outside the U.S. and Canada, 1-215-386-0100, extension 1483. Subscriptions are $245.00 for one year.

POLLEN SHORTAGE

New genetic development by Plant Genetic Systems of Belgium may make hybrid seed production easier and less expensive. PGS has constructed and expressed a gene that prevents pollen development. This allows a male sterile gene to be created without manual removal of the anthers, which in turn prevents self-pollination during the hybridization process. The protein encoded by the "lethal" gene is expressed only during the few critical days when pollen would normally develop. After rendering the plant male sterile, this protein disappears. Oilseed rape is the first crop using this technique, but they are targeting other brassicas, tomatoes, and lettuce within the next year and discussing joint ventures with U.S. and European seed companies.

American Vegetable Grower

LOW INPUT AGRICULTURE

LISA's been hurt by the economy. Allan Lines, agricultural economist at Ohio State University, says the economy, not tradition, has played a major role in keeping Low-Input Sustainable Agriculture (LISA) from catching on as well as it might. In recent years, chemicals and fertilizers have become less expensive relative to the extra equipment, fuel and labor needed by LISA techniques. Consequently, farmers are encouraged by the market to use chemicals instead of the more expensive, less effective mechanical methods.

Lines says that if Americans are serious about reducing the amount of chemicals used in agriculture, they must be willing to pay higher prices for farm products to offset the quantity and quality lost by using less chemicals. And that must happen across the board, not just in high-profile fresh-market crops, he says. Corn and soybeans account for 80 percent of chemical pesticides used on major field crops.

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You Really Know You're A Beekeeper When...

JOHN DROMEY

You've spread more smoke than a forest fire.

You've been stung more times than a pincushion at a quilting party.

You cause the neighborhood to break out in hives.

You can't read a recipe without wondering how it might be improved with honey.

In warm weather, you feel naked without a hive tool in your hands.

It would take you about ten minutes to round up a cast of thousands for a "bee" movie.

You practice "flour fidelity" by not switching brands halfway through stirring up a batch of cookie dough.

A mention of the original "Thirteen Colonies" makes you think back to the days when you were just getting started in beekeeping.

The only body-building you're really interested in is assembling beehives.

You sleep on foundation sheets.

During the honey flow, you shake hands with a frame grip.

You get "bottom bored" sitting around the house all winter.

You don't have to look at the calendar to figure out the last time your home was a "beehive of activity"

You can have an audience with the queen anytime you want.

You know when to mind your own beeswax and when to purchase fresh foundation.

Your letter carrier no longer breaks out in a cold sweat when delivering packages that buzz.

You refer to the bubble gum found under theater seats as propolis.

You know a honey of a deal when you see one.

You've done more uncapping than gusts of wind at a ballpark.

You don't need hive scales to figure out there's something fishy about a colony's condition.

As far as literature is concerned, you're a "bee" student.

You know what practically anything worth seeing outdoors looks like when viewed through a veil.

During honey-harvesting time you draw visitors like flies: old high school friends you haven't seen all year suddenly decide to look you up; neighbors from miles around drop by to say howdy; and long-lost relatives come swarming out of the woodwork.

Anytime you need to get somewhere in the shortest time possible, you make a much-better-than-average beeline.

You're not at all surprised to hear about a nervous beekeeper who became the proud possessor of a "green thumb" in 1989 as the result of a queen-marking miscalculation, when that color covered up the "red" marking he'd acquired on his opposable digit the previous year in a similar accident, plus the likewise misplaced "yellow" from the year before that, the "white" from '86, that followed the "blue" of '85, so that he'd consistently had the current year's color code for marking queens right at his fingertips.

You're as relaxed around bees as a Christmas tree is in summer, or a turkey on July 4th.

You can get into and out of a bee suit fast enough to make a fireman jealous.

You've shaken more frames than an earthquake.

Your storage shed is honeycombed with places to put beekeeping supplies.

You're willing to go out on a limb to capture a swarm.

BOTTOM·BOARD