NOV '90

GLEANINGS IN BEE CULTURE

THE WEST

Western Equipment
Stress, and Honey Bees
The Great Pacific Northwest
California Pollination Business

ROOT™ PUBLISHING

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Columns

Departments

COVER *After great debate and much discussion our staff chose this month's cover from among the 100's of photos under consideration depicting the wonderful west. Fireweed* (Epilobium angustifolium) *is probably more common in the northern regions but in our opinion few plants make a finer honey crop. But regardless of your favorite honey, whether it's fireweed or raspberry, creosote bush or tarweed, mesquite or catclaw, welcome to the wonderful west.*

Photo by Diana Sammataro

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(ISSN 0017-114X) Vol. 118, No. 11

117 Years Continuous Publication by the Same Organization

Features

INNER·COVER

This issue of *Bee Culture* is the first in a series of regional studies of beekeeping in the U.S. We started with the Wonderful West for a couple of reasons, but primarily to introduce our three newest occasional columnists.

Dr. Mike Burgett, who takes a thorough and entertaining look at the Pacific Northwest this month, was born in PA, and got his BS in Biology at Edinboro State College. After a two year stint in the service, he did graduate work at Cornell with Dr. Roger Morse. From Cornell he went directly to Oregon State University, in Corvallis, as assistant professor of apiculture in 1974. Now a full professor, he teaches graduate and undergraduate beekeeping courses, is the State Extension Apiculturist working with beekeepers, commodity groups and anyone interested in bees or beekeeping, and conducts research in the areas of pollination and mites.

Dr. Burgett has contributed to *Bee Culture* often in the past, but we feel especially fortunate to have him on board now. He says he will be sending in four or five articles over the next year, and, with his experience and resources in extension, commercial beekeeping, pollination and of course the basics, each should be a keeper. Welcome aboard, Mike.

Dr. Eric Mussen, from Davis, California is the second introduction I want to make this month. Not a regular contributor to any of the beekeeping journals, Eric keeps busy publishing his own newsletter, *From the U. C. Apiaries*, which is part of his Extension duties. But let me backup a bit.

Eric grew up in Natick, MA, and earned his BS in Entomology from the University of Mass. His PhD work at the University of MN was in Entomology, with a strong background in both plant pathology and microbiology.

He started as California's Extension Apiculturist in 1976, and has been there since. With the extremely diverse areas of beekeeping that co-exist (more or less) in California — hobbyists, sideliners, queen and package producers, pollination businesses and probably more — Eric brings a wealth of information and experience to the pages of *Bee Culture* on his admittedly random basis.

He is a one man show in California, and "time to write is at a premium", he says. An easy-to-believe statement. Nevertheless, he'll be around three or four times in the next year, so keep your eyes open for Eric's Western Writings.

The next introduction will be limited here, because we did an article about her activities last month. Sue Cobey, though now from Ohio wrote her article on Cordovan queens while she was living in California (which is why it is here this month). She will be doing several pieces on every aspect of queen rearing we can think of over the next year. Entitled "The Queen and You", her series will be more-or-less regular, and, we hope, extremely helpful.

We aim at an audience of mostly beginning queen producers, which is not, by any stretch of the imagination, beginning beekeepers. However, after reading a few of these *anybody* will be a better beekeeper, because that's what it takes to raise good queens — good stock, and good beekeeping. But even if you've been in the business awhile, I'll bet you pick up on some of the things Sue has to say.

So welcome Mike, Eric and Sue — valuable additions to *your* beekeeping magazine.

•

A lot of people who read this magazine couldn't care less whether they ever make a dime on the hobby of beekeeping or not. They're just not in it

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New Blood

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NEXT MONTH

The Bee Line Express continues its journey as we take a look at beekeeping practices and problems 'Down East'.

Dr. Larry Connor takes a long hard look at all of New England, except for New York which will be covered by Dr. Roger Morse.

Also from New England next month, we've got a surprise, world-famous author, writing about beekeeping traditions in old New England.

And, this past summer we visited a Pennsylvania beekeeper, who doesn't fit the traditional New England beekeeper's mold. Here's a great how-to for anyone with not enough hours in the day for beekeeping.

Our newest columnist, Dr. Dewey Carron, from the University of Delaware will be covering the Mid-Atlantic states, an area with which he is extremely familiar.

Stay tuned next month for a good look at 'Down East'. But of course there's always more.

And last, but certainly not least, the Annual Index.

Don't forget the Honey Report, the Mailbox, the great how-to's and all the rest of the regulars, all coming in December *Bee Culture*. □

MAILBOX

■ Think Creatively!

In response to the "no name" letter in June Mailbox about selling honey, this person is going to have to develop her market.

I take mine to the local garden club every fall and it always sells out. Some of them come to the house later for more. (There's a limit to what I can carry.)

Others buy because it is raw and they want it for medicinal purposes. Another group of buyers work with my husband.

I noticed someone has set up a stand at the local farmers' market to sell honey.

Think creatively!

Rose Farnsworth
Kingston, WA

■ Management Question

I would like to respond to the August issue of *Gleanings* in a couple of regards.

Firstly, the Cover Article: "Kids and Bees" was simply delightful. It seems that it is too few and far between the times that we see such subjects in our Bee Journals. After all, these are two of our most precious resources: our children and our bees. I think that Ms. Cobey in particular deserves special thanks for taking the time to put together that article. It would be great to see more of the same!

Secondly, I would like to point out what I feel to be a couple of erroneous assumptions on the part of Dr. Richard Taylor with regard to Brother Adam's method of beekeeping in England.

Dr. Taylor makes mention of how he found Buckfast Abbey to be using "these big hives" meaning, of course, the use of Modified Dadant type of hives which are commonly used in Great Britain today. Also, I gather from inference, Dr. Taylor suggests that due to the use of such equipment, "extensive feeding of sugar syrup would commence" in early Spring.

Taking somewhat of a liberty on my personal association with Brother Adam, I would offer the following: The use of "big hives" or Modified Dadant, is actually more conducive to efficient egg-laying with prolific queens, such as the Buckfast, due to the unbroken, but large area afforded by the size of same. In the U.S. this does not seem practical given our standardized equipment. Nevertheless, this is the primary reason for their using such "large" equipment. The use of our standard 9-1/2" brood chamber is however, easier for migratory beekeepers to move.

In addition to this and, perhaps more importantly, Brother Adam's apiaries are, and have always been devoted primarily to the breeding and development of the Buckfast Strain of Honey Bees. Contrary to Dr. Taylor's assumption, they do not regularly feed sugar syrup to their production colonies at Buckfast Abbey. Rather, only in emergencies and then, primarily to help prolong certain genetic lines under investigation.

I would like to add that I do not feel Dr. Taylors article is overly critical, but rather, more indicative of the common criticisms that many American Beekeepers have of British Beekeeping in general. We will, in the U.S. probably achieve a genetic resistance to the Tracheal Mite through the breeding stock from Dr. Morse of Cornell and, the long-established resistance of the Buckfast Bee from Brother Adam. As of July, we have 100% Buckfast queens being tested at the USDA facilities in Baton Rouge and should have results within the year. Weaver Apiaries of Navasota, Texas is the sole supplier of Buckfast Queens in the U.S.

In closing, I'd like to say that the most important point seems to be the improvement and advancement of beekeeping in general, both for our current situations, and for generations to come.

Allen Summers
Boulder, CO

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■ Really Class

I wonder how many readers chuckled as they read: "Then there's the not so ordinary. Ormond Aebi grounds his hives by attaching a ground wire to the wire grid of the queen excluder and thence to a stake driven into the ground ... no doubt, some techniques work simply because the beekeeper believes they do." A Class Act, *Bee Culture*, July.

They can stop laughing. Lost in the volumes of history is the total number of discoveries, inventions and the like, that started out as only a hunch. The Aebi's hunch about grounding the queen excluder has some basis in scientific fact.

Today's jet air travelers, flying high above the clouds, are unaware of airplane static. But those of us who've been around a while recall the piston engine, propeller aircraft of former days; when airplanes flew at five to fifteen thousand feet altitude. Those flexible fingers dancing along the trailing edge of the wing, out toward the tip, are for static discharge. Collide with a cloud, especially at night, and a nebulous ball of ionization suddenly appears, equalizing the potential.

Radio stations spend lots of money to reduce the effects of static electricity, from those tiny zaps in the studio that send computers and automated equipment into a tizzy, to lightning bolts that enjoy striking the same place, the sta-

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MAILBOX

tion's tower, more than once. Although each installation is unique unto itself, the basic solution for each problem is the same, and *always* includes a good ground. Lightning and static electricity do not behave according to the laws of good engineering practice.

A radio station tower picks up several thousand volts of induced electricity from a lightning storm while it is still several miles distant.

But, you say, the screen of the excluder isn't moving and it is insulated. Walk across a rug and touch a doorknob. Or slide off a plastic chair and touch the same knob. Chances are you'll react, too. In the northern tiers of states, who hasn't been zapped as they slid across the car seat in winter then touched the metal of the vehicle? Take off a nylon or dacron shirt in the dark on a dry day? Keep your eyes open as you pull your arm out of the sleeve. You can hear it, too, like corn popping.

Flying bees are bound to pick up some static, especially on days of low humidity. In nature they do not normally come in contact with metal screens. Who can unequivocally state that bees don't or can't detect a slight zap each time they touch the metal excluder, much as when we touch that doorknob?

Because of skin and body resistance 10 volts is about the minimum we can detect as an electric shock. How sensitive are bees? Imagine a bee in contact with the metal excluder. Other bees form a conducting path to a whole cluster. A flash of lightning induces a voltage in the excluder and the bee(s) acts as a conductor to the cluster. You can bet a super full of honey that those bees aren't stupid. They associate the zap with their contact with the metal.

Whether the Aebis have developed their system through objectivity or intuition or both, more power to them. A very wise man once wrote:

But sneer not thou at those who rise
To loftier illusions.
Great truths are oft, the sage
replies,
Foreshadowed by delusions.

L. Edwin Rybak
Morrisville, VT

■ Bear Tales

Mr. Goltz's "Bear" sure hits home. For years I raised Bees in upstate New York — never had any problem. For the last seven years, bears have hit me at least every other year. This year they even hit me right at my home — where I had stacked some hives that had died during the winter. Equipment was scattered for hundreds of feet. Mostly frames were destroyed. The bear ate foundation, wax, plastic, bees (dead), honey, etc.

Ah, the joys of beekeeping — with all its trials and tribulations. I wouldn't give it up — "I love beekeeping" much to the consternation of my family.

John Pedigo
Oyster Bay, NY

■ Recycled Expense

I'm reading your recycling article in the July issue of *Bee Culture*. I got the impression that recycled paper might be more expensive than paper made from virgin pulp. Is that correct and if so how can that be possible.

Charles McDonald
Baton Rouge, LA

Editor's Note: Making new paper from recycled paper requires the costs of collection, processing (chewing up the old paper, de-inking, bleaching, etc.) than making paper again. Unfortunately, the amounts are small and the facilities to do it are few. The economics of scale are the primary offenders here, but so are the lack of large-use customers.

■ Feeding Pollen

In March Questions? - Answers! Chic Bearce asked about his bees' disinterest in pollen substitutes. He might be interested in a different answer based on the formula given in Washington State University's EM 2625. My bees consume it with great gusto and store it like pollen as well.

For one hive, I add to nine tablespoons of pollen substitute 1/2 cup of sugar and three tablespoons of pollen. (I haven't tried it but wouldn't be surprised if less pollen might work as well.) Water is added and the amount is critical if you put it in the hive the way I do; I use four tablespoons.

Stir the pollen into the warm water until the pellets disintegrate, add the sugar and then the pollen substitute. The mixture is very thick and sticky. I tape strips of wax paper about 1-1/2" wide onto a breadboard and then use a kitchen knife to scrape the mixture out of a tablespoon into long, narrow mounds on the strips. This quantity of mixture produces about 12 to 20 mound/strips about three inches long. I place each of these on the top bars of the frames in the top brood chamber. Holding each end of the wax paper strip, turn it upside down — the mixture sticks to the wax paper — and lower one end of the mixture mound onto the top bar and gently lower the other end. Since I don't smoke my bees, the top bars usually are more or less crowded with bees so I clear a spot an inch or so long with a hive tool, lower the first end of the mixture mound there and slowly wiggle the rest down to cause the bees to get out of the way. Finally, press the strip firmly down onto the top bar with the rounded end of the hive tool. The wax paper keeps the mixture from drying out and the bees remove it bit by bit as they consume the mixture. It also prevents sticking to the frames above.

Dan Hendricks
Mercer Island, WA

■ *THE* EVENT!

The front page headlines of the August 10th edition of the *Boston Herald* will not be soon forgotten by many persons in the honey industry. Those five words, "Feds test for toxic honey", had the potential to cause immediate and irreparable harm to the image of our product. Memories of the Alar incident are still fresh in the minds of many, and the fear that the honey industry could also suffer heavy losses is very real.

The following outlines the events that occurred once the *Boston Herald* article was published.

- The National Honey Board first received notice of the *Boston Herald's* article early on the morning of the 10th of August. Mary Humann, acting Executive Director, immediately enacted the Crisis Management Program, designed to enable the Board to react efficiently and effectively to industry threatening situations. Phone calls and faxed copies of the article went out to the executive committee, Thomas J. Payne Market Development and Evans/Kraft Bean.
- The Honey Board contacted and

MAILBOX

obtained the services of an experienced public relations specialist. Mary spoke with Jack Hamilton of the FDA, who explained that a complaint had been filed that migrant beekeepers were illegally using chemicals. Jack confirmed that extracted honey from two packers was to be tested, but no nationwide testing was planned at the present.

- With this information and the cooperation of the FDA, the Honey Board issued press releases to Associated Press and United Press International, as well as many of the industrial and retail consumers of honey who had expressed concern. By communicating positively with the FDA, the Honey Board was able to stay fully informed of their actions and plan accordingly.

- Under the leadership of Mary Humann, the Board served as the industry spokesperson, worked with the FDA to calm the potential spark of another Alar-like fiasco, and presented a united front to the public.

Our industry was fortunate this incident has not caused a large percentage of the U.S. population to doubt the purity of the nation's honey supply. A recent market survey found that 93% of U.S. homemakers believe that honey is a healthy, wholesome product.

Safe guarding that image is the responsibility of both the producer and the packer. One cannot exist without the other, and they must coordinate their efforts to guarantee their consumers are receiving a safe product.

Honey producers must be willing to guarantee their product's purity to the packer. This guarantee should be exemplified by proper use of ALL pesticides and a willingness to test their honey for excessive levels of pesticides.

Packers must know the quality of honey that has been purchased. Once the honey has been sold to the end user, the packer bears the ultimate responsibility for it. Since the articles on fluvalinate appeared, the consumer will expect you to be monitoring the pesticide levels in your product as a means of routine quality control. If fluvalinate appears again on the front page of a newspaper and you have no written testing procedures or laboratory results, you may lose a large part of your business to another packer who has shown concern for the consumer by testing. Monitor your product.

The apple industry had four minor incidents with Alar, previous to the last and most damaging article. Consider this minor incident a warning, and let's get our act together.

Bill Gamber
Dutch Gold Honey, Inc.

Editor's Note: The Boston paper hasn't let this go yet, and has continued to publish articles relating to this incident. I concur completely with Mr. Gamber's admonition "to get our act together" relative to using chemicals in bee hives. But I also know that a well informed and well prepared beekeeping industry is absolutely critical to acting responsibly — both to the people who buy our product, and to the press who *must* report on events such as this. History has always shown that coverups are stupid in the short run, and always, always do more damage in the long run than full disclosure and dealing with the situation openly and aboveboard.

■ Massachusetts Madness

Your article (with the above title, which appeared in the October issue) seems in very poor taste, and it's the last thing honey producers need to have happen. As soon as it was aired on TV action was taken to cool it off 8/8/90. Things were well in hand to put the lid on this nonsense and we felt it was put to rest. The last place we ever expected to find it blabbed in headlines was in the Bee Journals.

My God, why perpetuate a problem when by your own admission you didn't know "how much of it was true" The sale of honey definitely reflects on the economic atmosphere of the industry press, and I would think you of all people would be aware of this fact.

It's a poor way to treat the hand that feeds the industry and from which we both make our livelihood.

Ray B. Davis
Davco Bee Supply Company

P. S. Troy Fore did a remarkable job and before he said anything he looked into the whole situation thoroughly and wrote the article so it wasn't so damaging but "Mass Madness" headlines did a lot of harm to the bee business.

■ Support The Honey Board!

It would be a great pity if the National Honey Board were to be killed because of the greed or shortsightedness of a few. Since it has gotten momentum, they have done a great job of publicizing honey and increasing the demand.

Cigarette manufacturers spend about 38% of their gross to advertise a product and convince people that they need it, when it has no real value.

Is two percent of our gross too much to continue promoting honey and increasing the price and demand?

Before the second world war, the American Honey Institute in Madison, Wisconsin did their part to advertise honey nationwide, especially with honey recipes.

It died during the war for lack of support.

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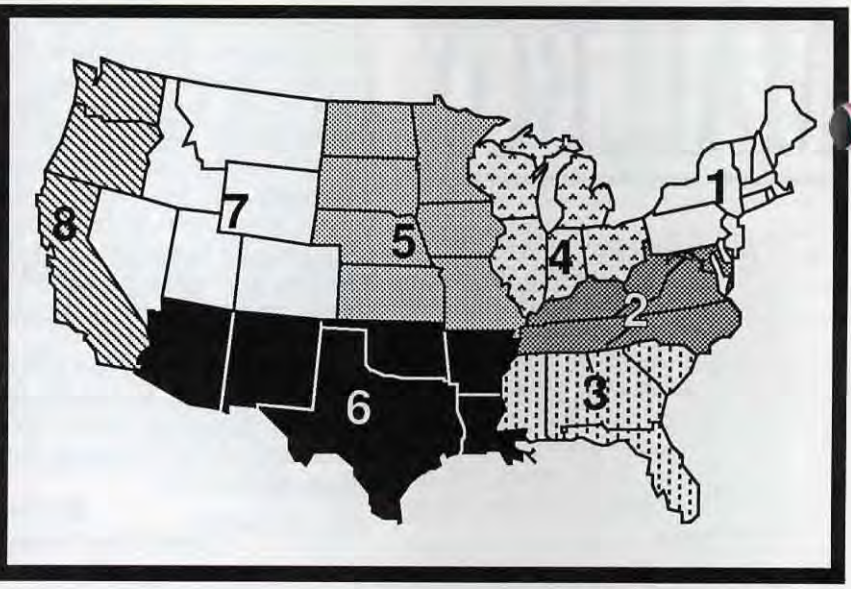
NOVEMBER Honey Report

November 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.



	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 # Wh.	40.30	41.78	43.00	42.50	41.00	46.50	42.29	38.50	28.00-49.00	41.25	43.91	39.73
60 # Am.	39.30	35.43	43.00	41.50	39.00	42.00	38.00	35.10	28.00-47.00	37.89	39.75	36.18
55 gal. Wh.	.52	.48	.44	.50	.49	.58	.57	.54	.42-.61	.52	.48	.50
55 gal. Am.	.51	.45	.41	.48	.42	.52	.53	.48	.40-.61	.48	.47	.45
Case lots — Wholesale												
1 # 24's	28.80	31.26	39.60	25.33	22.95	24.75	28.75	29.13	20.40-42.00	28.47	27.83	26.42
2 # 12's	23.20	24.13	37.20	25.33	24.00	23.25	27.75	29.39	20.00-37.20	26.00	25.98	25.28
5 # 6's	27.15	26.63	26.10	24.48	22.50	27.00	28.75	26.58	22.50-31.20	26.82	26.70	27.40
Retail Honey Prices												
1/2 #	.93	1.24	1.21	1.20	1.15	.89	1.04	.98	.75-1.39	1.09	1.11	.95
12 oz. Plas.	1.35	1.51	1.55	1.36	1.32	1.20	1.45	1.40	1.20-1.98	1.41	1.42	1.35
1 #	1.53	2.08	1.74	1.61	1.72	1.57	1.70	1.61	1.39-3.43	1.74	1.63	1.55
2 #	2.58	3.18	3.41	3.35	2.56	2.75	3.19	2.61	2.25-4.00	2.95	2.91	2.77
2-1/2 #	3.50	3.60	3.50	3.45	3.53	3.25	3.40	3.00	2.37-4.00	3.42	3.39	3.68
3 #	3.75	4.21	5.20	3.49	4.02	3.85	4.30	3.83	3.25-5.89	4.12	3.77	3.87
4 #	4.25	5.08	5.25	4.75	4.79	4.50	4.98	4.50	4.25-5.25	4.77	4.72	4.85
5 #	6.00	6.10	6.25	6.08	5.75	5.15	6.20	5.85	5.00-7.00	6.00	6.12	6.06
1 # Cr.	2.25	1.25	1.63	1.69	1.25	1.88	1.89	2.34	1.25-4.50	1.96	1.73	1.64
1 # Cb.	2.13	2.15	2.00	2.20	2.15	2.07	2.21	2.63	1.25-3.00	2.20	2.26	2.37
Round Plas.	2.50	1.95	2.00	2.25	1.95	1.20	1.99	2.08	165-2.50	2.00	2.09	2.05
Wax (Light)	1.58	1.12	1.25	1.80	1.10	.98	1.00	1.25	1.00-2.50	1.28	1.26	1.05
Wax (Dark)	1.50	1.02	1.00	1.00	.99	.89	.90	1.03	.87-2.00	1.05	1.07	.92
Poll./Col.	30.00		30.00	30.00	23.00	21.00		24.00	20.00-30.00	26.00	26.63	24.20

MARKET SHARE

Retail sales, as reported by the Honey Board's survey are slightly below last years extraordinary surge. However, sales are still significantly above three or four years ago. Watch prices this year, especially white honey, and expect shortages by spring — of U.S. honey. Canada production up, and will fill gaps.

Region 1

Prices not rising as fast as predicted earlier. Generally depressed prices across the board. Sales only steady to declining just a bit. Fall flow from goldenrod average to reduced because of wet weather. Bees seem in good shape, with adequate stores.

Region 2

Prices steady to rising to meet increasing costs of supplies. Sales steady to a bit slow as tourist season winds down, Christmas season hasn't started and warm weather continues. Fall flows slowing on aster, goldenrod and wingstem. Oddly, swarming behavior reported high all through the region. Mites still a concern, with many treating with menthol during warm weather. Some reports of extender patty use also.

Region 3

Prices steady to rising a little, sales steady but not increasing significantly, probably due to warm weather. Last years population decline seems to have abated and colonies relatively healthy. Both mites still causing problems, but beekeepers slowly cleaning up their act after recent MA problem.

Region 4

Sales steady to rising, and prices rising steadily too. Production spotty, with some areas doing well, while others need feed. Erratic weather to blame, and large sellers buying from out of the region to meet sales demands.

Region 5

Wholesale sales strong due to production of white honey. Retail prices only steady and sales the same. However, production spotty and supplies limited. Some predict wholesale price significantly above buy back by Thanksgiving. Dry conditions the norm, but washouts in some areas.

Region 6

Sales steady to strong and prices good too. Eastern areas, with generally adequate moisture doing well, central areas dry and production average to slightly less. Southwest generally moist this year with bumper crops predicted. Spring crops should do well too, with even poor winter rains.

Region 7

Retail steady to increasing, and prices doing well. Dry conditions generally decreasing and good crops being reported in most areas. However, the north still is dry, and subsoil conditions bode poorly for next year without significant fall rain or snow.

Region 8

Sales in northern areas still strong, and sales in southern areas picking up. Crop about average throughout the entire region, but as usual spotty area of poor crops exists. Dry in the south still holds, with little change foreseen.

MAILBOX

So, while sugar was strictly rationed, and honey had such an opportunity to become commonly used in recipes, the demand and price remained the same for lack of public awareness.

If we agree to "let George do it", the National Honey Board will die a similar fate. And then what will the future of "Nature's Finest Food" be?

Ben Franklin had the right idea when he said, "If we don't hang together we'll hang separately."

Beekeepers, bottlers and importers, support the National Honey Board with your penny a pound, and no more refunds.

Stuart Kuik
Houston, TX

■ BIPP Payments Now!

Many around the country have heard that at the request of beekeepers in the state of Arizona, I have been researching irregularities in Beekeeper Indemnity Payment Program which ended in October 1980. I began looking into BIPP when conducting an historical search to find out what has been, and still is, killing large numbers of honey bees in Arizona.

I have found a final termination date for field administration for the program in the Federal Register, Volume 45, Number 176, Tuesday, September 8, 1980 for 9 October 1980 by the USDA/ASCS. However, I am unable to find a Federal Register determination relieving the USDA from paying off unpaid claims against the program. These claims were duly filed in good faith and accepted and verified in good faith by the USDA/ASCS acting as an agent of the Federal government.

I have been told several times, by congressional and agency contacts, that there are still unpaid claims in excess of $3.5 million from 1979 and 1980 for which funds are not available. Recently, further clarification was made in a letter signed by Richard T. Crowder, Under Secretary for International Affairs and Commodity Programs, Department of Agriculture, Office of the Secretary, 14 June 1990. The letter was written to the Texas Beekeepers Association, which, with the help of Jerry Stroope and Glenn D. Mace, has helped us gather information concerning the BIPP Program.

Beekeepers in other states have helped by writing to their congressional representatives inquiring about the BIPP program. Several have sent their letters or passed information onto me, so I can coordinate them all, and press forward.

In Mr. Crowder's letter, he stated that without available funding, USDA cannot make payments under the expired program. Further, in the absence of any funding authority (which would come from the Appropriations Committees in congress), USDA is not able to pay those claims it still has in whole or in part. Mr. Crowder stated in his letter that "there are unpaid claims in excess of $6 million from 1979 and 1980 for which funds are not available ($2.5 million in 1979 and $3.5 million in 1980).

BIPP was working when it was abruptly ended. What most beekeepers don't know is that it was paying for pesticide abuse in all 48 states. Perhaps it was showing too much what others did not want seen (and still do not want seen) concerning pesticides and abuse.

Legal debt accrued, (and knowing that the government runs two years behind with accounting practices) does not mean that debt cancels when programs are terminated. Even the legality of the termination is in question now, after having done much reading.

I, and others have been working hard to get beekeepers paid, both within Arizona and across our nation. However, since BIPP was a national program it is only right that the two national beekeeping groups become involved in appropriating these funds.

Consequently, I have sent a request to both Nationals (AHPA and ABF) to ask for their help and support in this matter, with a solitation for their lobbying help so that all unpaid BIPP claims can be finally paid.

Dee A. Lusby
Tucson, AZ

■ An Interesting Thought!

The news media is scaring the public about Africanized honey bees. Beekeepers are trying to fight back by educating the public.

I suggest that beekeepers should relax and let public panic take over. Then we do to honey prices what the oil industry has done to gas prices.

Joe Keen
Sturgis, MS

■ Honey Board Refunds

I read your September editorial on the National Honey Board refund issue with a great deal of interest. I found it refreshing to see someone of your stature in our industry who is willing to take a position on a matter as important as this one is. perhaps your insight and your eloquence will be able to make the difference to some who hadn't taken the time to look at the "whole picture"

Like you, I wholeheartedly support a VOLUNTARY Honey Promotion Program. I think that, for the most part, the NHB has done a great job for us, and will continue to do so. I feel that part of the reason for this has been the producers' right to be refunded. The NHB has always had to answer to those that are paying the bill, the producers. The refund provision is, after all, the producer's only real assurance that their money will be spent as wisely as possible. In today's economy, none of us can afford to have our money spent unwisely. And as you so well stated in your editorial, *this is only one of several reasons to Keep The Refund.*

Again, thanks for your column, and thanks for your magazine.

T. Ray Chancey
Dayton, TX

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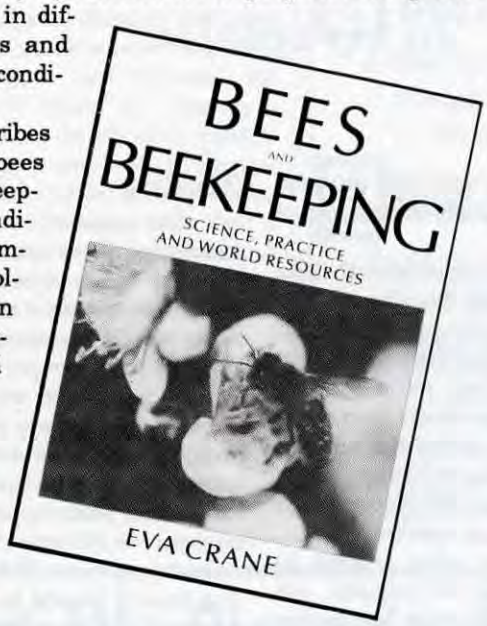
Bee Culture Book Review

■ ***Bees and Beekeeping, Science, Practice and World Resources*** by Eva Crane, published by Heinemann Professional Publishing.

In this book, the most comprehensive volume on beekeeping yet published, Eva Crane presents the scientific principles underlying effective beekeeping and their practical application in different climates and under varying conditions.



Part I describes the different bees used for beekeeping, both as individuals and members of their colony, followed in Part II by information and practical instruction on modern beekeeping with movable-frame hives. In Parts III and IV Crane takes up well-tried alternative equipment, including hives that are simpler and cheaper, and she treats the maintenance of bee health and protection from diseases, enemies, and injury from pesticides. The next part covers bees' plant resources worldwide, as well as products of the hive. Beekeepers themselves are the subject of Part VI, which offers a chapter devoted to law as it affects them in different countries and one on the many resources available to beekeepers. Enhanced with historical illustrations, anatomical drawings, distribution maps, and photographs, the book contains two appendixes, a comprehensive bibliography, and four indexes.

Eva Crane, OBE DSc, was Director of the Bee Research Association from its foundation in 1949 until her retirement in 1983, and she was largely responsible for its development into a world-wide organization. It became the International Bee Research Association in 1976, and from that time she was increasingly concerned with the development of the scientific basis of beekeeping, in the subtropics and tropics as well as in the temperate zones.

For thirty years Dr. Crane edited the journals *Bee World, Apicultural Abstracts* and *Journal of Apicultural Research.* In addition to many journal articles and papers, she has written and edited a number of books including *Honey: A Comprehensive Survey,* published by Heinemann in 1975 and still the standard textbook on the subject.

Cornell University Press

■ ***Earth Book for Kids*** by L. Schwartz, published by The Learning Works, P. O. Box 6187, Santa Barbara, CA 93160 (ISBN#0-88160-185-0) $9.95.

For anyone who has even the smallest concern for mother earth, this book is full of fun things to do for you, your kids, even your grandparents! We've even reproduced a few pages here.

Teachers will find this book especially helpful for creating their own "Environmental" curriculum. Grandparents or parents will be eager to give this book to their own family members.

What does the book contain? It is broken down into five parts. The first, energy, resources and recycling, discusses recycling papers, plastics, cans and others. Not only does each page have a quick, but thorough, explanation, but has fact side bars as well as "Earthwords" — quotes from famous people. Sprinkled here and there are short bios of people who contributed in some way to their earth, as well as ideas for projects or research ideas for school.

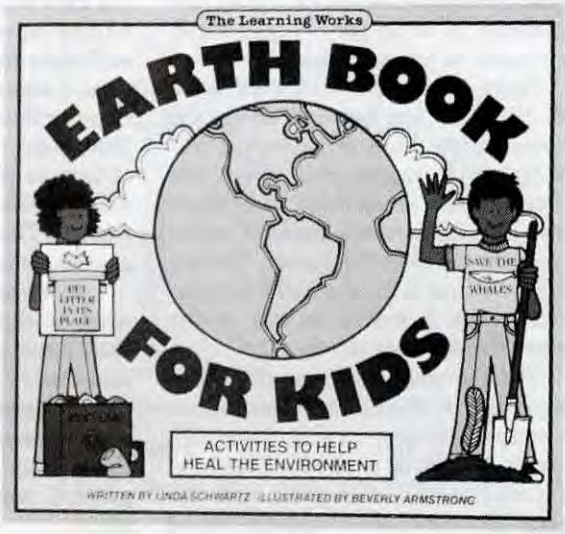
The second part, air, land and water, covers topics like water cycle, saving water, acid rain, pollution of water and air, and pesticides. While none of these are new topics, their importance is not diminished by time.

Plant and animal habitats in the third part discusses the web of life, deforestation, compost, endangered animals, why not to buy exotic pets, and more. Without being gloomy and depressing, this book nevertheless brings home the fact that plants and animals are being destroyed due to habitat destruction, collection in the wild, hunting and poisons.

In the fourth part, more ways to make every day Earth Day. Examples of what you can do are illustrated. These include picking a course, how to raise money for it, designing a device, creating a game, poster or newsletter or how to write a letter to your congressman/senator, etc. It also goes into making cartoons, stamps or tee-shirts or banners, recycled paper projects and a shoebox diorama.

The last part where to write, and glossary is a good source for finding out more about environmental issues. Each page is filled with clever drawings and ideas, easily read by adults and children alike. If you have hesitated to purchase an environmental book, you can do so now. The only topic they didn't include was bees. Maybe in Vol. II?

Diana Sammataro



RESEARCH REVIEW

DR. ROGER A. MORSE

Cornell University • Ithaca, NY 14853

"In my opinion . . ."

During early September I attended meetings on recent research on honey bee pathology in Gent, Belgium. Some of the highlights of those meetings, attended by about 150 people from many parts of the world, but especially Europe, are discussed below. The emphasis was on varroa disease.

Apistan & Timing

The Apistan strips that are used for varroa control in the U.S. were developed as a result of research done in Europe (but by a U.S. company). Because the Europeans have a longer experience, there is much about these strips that they know that we have yet to learn. Apistan gives very good varroa control. The active ingredient is fluvalinate, a synthetic pyrethrin. Pyrethrins have been used by humans for insect control for 300 to 400 years. They have a low toxicity to mammals and are very safe for us. In the U.S., the Environmental Protection Agency dictates how a pesticide is to be used. Label directions must be followed closely.

There are several things we in the U.S. have not yet learned about the Apistan strips. Most important, I was told by my European colleagues, the strips (at least those used in Europe) have a long life, and are good for varroa control for three to five years. The active ingredient is impregnated into the plastic strip; it works its way to the surface slowly, very slowly.

The Europeans told me that after the treatment of a colony, they remove the strips and wrap in aluminum foil. They should not be packed in plastic as the fluvalinate will migrate into the plastic. The wrapped strips are stored in a cool, dark place until they are used again. This is definately in violation of the U.S. label.

There is a major problem with their Apistan strips. The fluvalinate will move into beeswax if it comes into contact with it. While the amounts will be small, the fluvalinate could remain. Properly used, there should be no residue and even if it occurs the amount would be below the tolerance level. However, to maintain the proper image for honey we want no residue.

In my opinion, after talking to several European colleagues, we should not place Apistan strips between combs as is currently demanded by the label. This is one aspect of the label that should be changed. A technique I was told about is to cut a number of round holes in the impregnated plastic strips and to have the strips cover the entrance much as a pollen trap would do. If the holes are large enough the bees will not lose their pollen loads as they move through the holes but will still come into contact with the fluvalinate. I was told that when used in this manner there is good control of varroa. Obviously, there should be more study of how to place Apistan strips in our hives, which are different from those in Europe. The idea of putting strips at the entrance may not be the best answer.

As an aside, it was pointed out that prior to experiments on varroa mites that have been conducted in Europe and the U.S., apistan strips have been used to cleanse colonies of varroa. If the strips were used according to label there may have been some residue present, which might influence the results.

Timing

One paper on varroa stated that a reduction of the post-capping (pupal) stage by one hour would reduce a varroa infestation in a colony by 8.7%. In other words, the more rapidly the bees develop in the pupal stage, the fewer varroa will have an opportunity to develop. Thus, there is a search underway for bees that develop rapidly. A paper by Dr. Ralph Buchler of Germany stated the post-capping period varied as much as 19 hours in races of European honey bees. This led to speculation that it should be possible to find bees resistant to varroa based on this trait. (We know that Africanized honey bees in South America develop in a short period of time and this is one reason why we suspect they may be resistant to varroa).

It was also reported that bees naturally resistant to varroa have been found in Tunesia.

Other Topics

Europeans do not understand why we are having such trouble with tracheal mites in the U.S. These mites are widespread in much of Europe. Still, as I talked with people I found that in times past, tracheal mites have been a problem in some places, even as recently as 20 to 30 years ago. I suggest that it would be appropriate for us to bring even more European queens into the U.S. in order to enlarge the pool of stock that might be resistant to tracheal mites.

It was a curiosity to me that several Europeans reported chalkbrood is a

Continued on Next Page

serious problem there today. This was not the case several years ago. Many in Europe believe there may be a connection between chalkbrood and varroa. However, I pointed out that somewhere, either in the U.S. or Europe, a new, more virulent strain of chalkbrood has evolved. I do not believe there is a direct connection between chalkbrood and varroa. However, when a colony has one disease it is much more susceptible to a second one.

Summary

Professor Ritter from Germany summarized the conference with two points. In Europe only a few researchers are looking at new chemicals for varroa control. There are already a sufficient number of effective materials. The research emphasis in Europe today is on studying the biology of varroa. The hope, of course, is to find a natural method of control. The second point he made clear was that chalkbrood was increasingly a problem in Europe as it is with us. □

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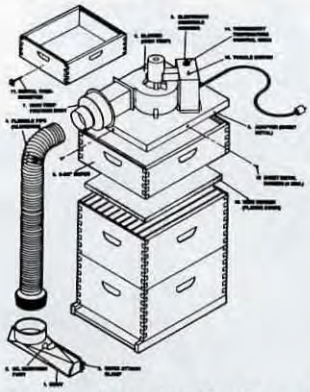

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NORTHWEST BEEKEEPING

Beekeeping in the northwest corner of the U. S. has a short history relative to the remainder of the country (with the exceptions of Alaska and Hawaii), so it is a pleasure to introduce the reader of *Bee Culture* to the beekeeping diversity of the Pacific Northwest. I have served as the apiculturist at Oregon State University for 16 years, continuing an apicultural tradition at this land-grant institution that goes back to the founding of entomology as a separate department 100 years ago. While I will admit to a certain familiarity with Oregon, my indepth knowledge of beekeeping conditions in Washington and especially Idaho is not as great. If I reference Oregon beekeeping more often than Washington and Idaho it is out of my better understanding of my home state. It is also my intent to stress the special atmosphere of commercial beekeeping in the region, but I hope also to address conditions confronting the hobbyist and semi-commercial beekeeper. Therefore, to the beekeepers from Oregon's magnificent sister states of Washington and Idaho, I extend apologies for any misinformation and ignorance I may put forth.

The first documented, successful, introduction of honey bees to the Oregon Territories took place in 1854 in the Willamette Valley of present day Oregon. The following account is taken from the *Oregon Statesman*, August 1, 1854...

> "Something new — John Davenport, Esq. of this county (Marion) has just returned from a visit to the States, and has brought with him a hive of honey bees, an enterprise hitherto supposed impractical. The bees are apparently in good health and not less in numbers than when hived for the journey. The hive in which they were confined is of the ordinary size, three sides being made of wire gauze, the fourth of boards."

MICHAEL BURGETT

Perhaps a few present day beekeepers in the Pacific northwest have forgotten that we were once a territory and honey bees therefore reached us prior to the tripartite division of the region and eventual granting of statehood.

In the intervening 136 years, beekeeping in the region has grown from this small but acclaimed beginning to an industry of vital importance to the region's large agricultural base.

The Pacific Northwest region (PNW) can be geographically interpreted in a number of ways, it is meant to include the present day states of Washington, Oregon and Idaho. The region is large and very diverse, both geographically, botanically and climatically. The combined total land area of the three states is nearly 250,000 square miles. The range in elevation goes from sea level to the summit of Mount Rainier in Washington; at 14,408 feet, the highest point in the 48 contiguous states.

Although the PNW is large in land area, it is not uniformly profitable for beekeeping. The region is environmentally so diverse that habitats range from the extremes of temperate rain forests found in western Washington and Oregon, to vast expanses of desert, to glaciated mountain peaks. Examples of unproductive commercial beekeeping areas include the high desert regions of central Oregon and southern Idaho, and the many, many square miles of coniferous forests found in all three states. As one would expect, such geographical diversity produces many different botanical assemblages which vary tremendously in the rewards they offer bees.

A premier geographical feature of

the PNW is the Cascade Mountains which divide the region along a north-south tangent into a wetter west and a drier east.

West of this mountainous ridge there are climate variations related to the coastal mountains and the latitude. Interior valleys, in the rainshadow of the coastal mountains are generally drier. East of the Cascades are found higher and drier plateau regions broken frequently with additional mountain ranges. Annual precipitation goes from greater than 120 inches in coastal mountain areas of western Washington and Oregon, to less than 10 inches in the drier upland desert areas east of the cascade ridge. Major rivers dissect the PNW, including the Snake River in Idaho, far eastern Oregon and Washington, and the magnificent Columbia River, flowing through eastern Washington and forming much of the border between Washington and Oregon.

With the exception of the Willamette Valley in western Oregon, commercial agriculture dominates the central and eastern areas of the region. And as is so often the case, it is in the regions of intense commercial agriculture where commercial beekeeping thrives. The development of extensive irrigation networks over the last 75 years, and especially within the past 25 years, has dramatically changed agricultural practices in the PNW and hence the beekeeping industry. This has been so especially in the drier central and eastern portions of the PNW where in past times access to water resources severely limited the types of crops that could be grown.

The table shows a summary of the bee and beekeeper populations of the PNW. From it some interesting observations can be made. Within the three-state region honey bee colony density (colonies per sq. mi.) is as follows: Washington 1.6, Idaho 1.3, Oregon 0.7, combined 1.1. (While interesting, colony density data are rather meaningless considering the large areas in each state which are, for all practical purposes, devoid of honey bees for environmental reasons. Additionally, honey bees must normally follow mandatory rules created by human "keepers" and therefore, tend to aggregate in regions where their "keepers" place them).

The numbers of commercial beekeepers in each state are very similar, but not so the total number of registered beekeepers. Very few beekeepers are found in Idaho and most interestingly, the 52 commercial beekeepers comprise 33% of the total beekeeping population in Idaho and additionally, account for 94% of all the colonies. (I was initially astounded to see so few beekeepers and a dominance by commercial beekeepers in such a large state, but one needs to remember that Idaho is also historically one of the states with the lowest human population for many remote areas in this depopulate and spacious state 'you can't get there from here' is true).

Contrasting the human populations of the three states also provides insight into the beekeeping situation: Washington 4.6 million, Oregon 2.7 million, Idaho 1.2 million (as an amusing diversion, the human density per sq. mi. is: Washington 67.5, Oregon 27.8, Idaho 14.4). What all this means, in a sense, is that while humans are rather spottily and unevenly distributed in the region, honey bees are found throughout the PNW in those areas determined by beekeeper experience to profitably support bees.

The PNW represents a beekeeping "fair share" relative to the remainder of the U.S. With some 286,000 colonies, we possess 6.8% of estimated U.S. colony population. The 3,700 total beekeepers represent 1.7% of all U.S. beekeepers. PNW commercial beekeepers

Continued on Next Page

Colony Number and Beekeepers of the Pacific Northwest[1].

State	No. registered colonies	No. registered beekeepers	Commercial beekeepers[2]
Washington	110,000	1,800	65
Oregon	70,000	1,750	50
Idaho	106,000	150	52
Total	**286,000**	**3,700**	**167**

[1]Data provided by the respective state Apiarists, Departments of Agriculture. Current as of 1990.

[2]Defined as individuals or companies registering more than 300 colonies.

PACIFIC . Cont. from Page 633

comprise 10.4% of the estimated 1,600 commercial operations in the country (U.S. figures from USDA). Considering that 3% of the human population of the U.S. lives in the PNW, the above statistical "summary" suggests that beekeeping is alive and well in the PNW and that we are particularly well represented in the commercial beekeeping sector.

Commercial beekeepers in the northwest rely heavily on the income generated by colony rental for pollination purposes, this is especially so for beekeepers in Washington and Oregon. The overall honey "economy" of Idaho, and eastern Oregon is such that commercial beekeepers there produce a larger portion of operational gross from honey sales, and rely less upon pollination rental.

In future columns I will address in far greater detail the honey production situation, the tremendous pollination input by honey bees to the larger agricultural industry and aspects of PNW beekeeping that are perhaps unique to our diverse region. □

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HARK THE HERALD . . .

KIM FLOTTUM

A somewhat subjective look at Nick Tate, the *Boston Herald*, Fluvalinate, honey, beekeeping, and a form of journalism.

Only someone stranded in a far, far outyard for the last 90 days or so hasn't heard of Nick Tate, the *Boston Herald* and The Incident. But if you were one of these unlucky few, we've collected and analyzed the articles, the information released by the Honey Board and others concerning the incident.

Nick Tate has been covering the environment, energy policies and public health for the *Boston Herald* for about four years. Starting in August, this second largest New England Daily published a series of articles by Tate about alleged pesticide misuse, migratory beekeepers, the FDA and tainted honey. Life has not been quite the same since for the U.S. honey industry.

To give you a taste of the Herald's perspective, here is a chronology of their headline coverage.

Aug. 4 — Probe May Sting Pesticide Users ... The first story outlined the finding of alleged pesticide misuse in pollination units in Massachusetts. Several un-named sources were quoted, and several errors were made in the article regarding details of the incident. But, a real-life pesticide incident did occur, and it was brought to the attention of EPA, FDA and Massachusetts state regulating officials. And the *Boston Herald* reported the story.

Nick Tate, in an interview with *Bee Culture* in October said that his initial source, who he has yet to identify, was "... very close to the incident. And I respect his request for anonymity. If I released his name, he wouldn't be able to be as close to the story as he is now," Tate said.

Aug. 10 — Pesticide found in state honey prompts Nationwide FDA testing... Tate's second story on Aug. 10 contained little new information, giving a bit of history and again stressing the possibility' honey in the buy back program may have been affected.

Aug. 11 — Feds Target two firms in probe of honey supplies ... On Aug. 11, a four-column-wide cartoon, showing a bottle of honey with a modified skull and crossbones lead off an article that began to back off from earlier claims of nationwide testing and fears of buy back problems. But again, the unnamed source was quoted regarding nationwide problems. However, in the very next paragraph the FDA was quoted as saying there was *no* indication of problems outside the two operations under investigation.

Aug. 15 — Honey Probe Spreading ... By Aug. 15 the story had moved to Maine, where officials, it was reported, were going to test local honey. Again, the unnamed source was quoted, (the identical quote, by the way), who feared 'symptomatic' misuse, and possible USDA supplies being tainted. Schools and senior citizens were once again threatened by the problem, according to the article. It was suggested that the ME tests were possibly related to the MA incident.

Aug. 17 — Feds Mull Nationwide honey tests ... On Aug. 17, on page 10, Tate couldn't find any more tainted honey, no matter where he looked. So to keep interest kindled, he again brought up his unnamed source, and the veiled threats to children and seniors. Because of this four more states were convinced to take a look at honey. All were, apparently associated with the initial incident in some way.

Calls mount for responsible reporting

Continued on Next Page

HERALD . . Cont. From Page 635

Aug. 21 Cartoon - (Honey Task Force) ... On Aug. 21, the *Herald* ran a cartoon depicting the Honey Board's Industry Task Force as a bunch of 'gun totin', cigar smoking zealots, shooting bees, barrels of pesticides, and anything else in the way. The caption read "you can run, but you can't hive."

Sept. 14 Pesticide level high in Maine honey ... Mr. Tate must have been occupied elsewhere for awhile, because it wasn't until Sept. 14 that he was again on the trail of tainted honey. A sample pulled in Maine was alleged to be above the EPA tolerance. And again, to fan the flames Tate suggested that "if substantiated, suggested wide spread pesticide misuse, particularly among migratory beekeepers", according to the still unnamed source.

Sept. 15 — Three more states find tainted honey ... Then, on Sept. 15, Tate quoted a beekeeper's story on new findings. The story, however, was inaccurate. Even more inaccurate though, were Tate's comments on the source of information — the state's newsletter.

So, up to mid-September, not much had happened, really. During this time the Honey Board has issued several news releases regarding the incident, and had activated a standing industry task force, which met in late September. Also, the American Honey Producers, the American Beekeeping Federation and Zoëcon had issued releases, outlining the errors in the *Herald's* stories, their particular stand on residues in honey, and their thoughts regarding anybody foolish enough to use a chemical in a beehive without following label directions.

Oct. 7 — Official urges industry to test honey Nationwide ... In early October, Tate was at the Apiary Inspectors of America meeting in Tucson, and had the opportunity to talk with scientists, regulators, and myself. The story that came from this was, in my opinion, probably the most balanced of any previous article. Jim Bach, president AIA, was the focus of the story.

The bigger question though, is why has Mr. Tate continued to follow this story?

"I'm not an advocacy reporter," he said, "but rather, I want a balanced story."

To date, 235 samples have been tested, five samples have shown traces of fluvalinate — a USDA test in ME; a state test in CA and another in ME; and two NHB tests in FL — but none have exceeded established EPA tolerance.

Regarding these findings, Tate stated during our interview, that "had the story not come out the way it did, I'm not sure the industry would have made the changes they've started."

Mary Humann, when asked if this was the case, said, "Absolutely not! We have had task force meetin[illegible]s long ago as last year. However, when the story first came out, it did provide a sense of urgency to the Task Force," she concluded.

Tate remarked that he thought it "commendable" that the National Honey Board had commenced the Task Force, and was working to inform and educate industry members, but at the same time expressed concern regarding the amount of control he perceived the Honey Board using over industry members. Specifically, he said, "Referring all calls from any media to the Honey Board is too much control. It gives the impression," said Tate, "that (the media) is on notice that the industry doesn't want any information going out that isn't controlled by the Board."

Why this story was not as devastating as the Alar® incident remains a mystery, at least to Mr. Tate. "I can't believe someone hasn't picked this up," he said.

In the final analysis (which, I hasten to add may be premature), what kept this story going as long as it did was a variety of things.

Attention getting headlines; a kernel of truth in each story; a little change in each story; and a reiteration of many of the same scare statements in *every* release specifically:

- "It's symptomatic of misuse throughout the U.S." — credited to a source close to the investigation.
- Contaminated honey may have made its way into the federal 'buy back' program — which gives honey freely to schools, elderly centers and other human-service organizations.
- The source, "asking not to be named," said

Mr. Tate was able to push several sensitive buttons every time he published a story on this topic. He capitalized on the fact that people are afraid of being poisoned, that they become concerned when the lives of our nation's unprotected are threatened and never once did he cite his source. Journalistically he could do no wrong. He had his readers in the palm of his hand, and their only source of information was an uncorroborated, unidentified 'source close to the investigation'. This is a trick that has been used since before Guttenburg invented the press.

There's no doubt Mr. Tate has made a splash, at least with the *Herald's* readers. And, he has certainly risen the consciousness of the beekeepers in this country regarding pesticides and honey. His sin, if you choose, was to use time honored journalism techniques to gain attention to a not-so-spectacular story. But it was a story. An event occurred. To deny it is futile. To ignore it doesn't mean it didn't occur. Mr. Tate has made very sure we don't forget that. □

PRACTICAL ADVICE From A Western BEEKEEPER

LARRY GOLTZ
Redding, California

One of the sure-fire ways to arouse the ire of anyone is to deride the choice of his or her mate, religion, political affiliation or spare time occupation. I suspect I'll probably incite the same sort of indignation by revealing my opinions about selecting various items of beekeeping equipment.

Admittedly, I am prejudiced by personal preferences and lack experience with some pieces of equipment. A singular opinion is by no means a substitute for collective experience based on wide usage. At the risk of insulting your intelligence I will, however, boldly proceed to declare open season on some commonly held notions about buying beekeeping equipment. I have used, seen and heard of some affronts to the sensibilities of both bees and beekeepers offered on the market during the past several decades. But if anyone feels threatened, takes umbrage or complains of my remarks, I will simply plead temporary mental derangement brought on by being downwind of someone smoking a home-grown, northern California weed.

Hives

I have the handicap of no longer being young. This makes one aware of such shortcomings as no longer being able to heft 90 pound supers of honey. I find it convenient, if not imperative, to use the medium or three-quarter size, 6-5/8" units for both hive bodies and supers. I like the idea of interchangability between supers and hive bodies, and serves me well in my limited beekeeping business. (My wife still refers to it as my "hobby" since I cannot seem to make any money at it.)

Using three units to a hive allows adequate comb space for spring build-up brood rearing. I use nine combs in both supers and brood chambers, which makes honey combs easy to uncap and brood combs easy to manipulate, an advantage that becomes more evident as the hive bodies become older and more gummed up. For me, the medium size units are a compromise between the unwieldy full depth (9-1/2") units and the somewhat inefficient 5-11/16" shallow units. Commercial beekeepers usually cannot afford the luxury of handling units smaller than the full depth, as can I.

I winter some of my bees at between two and three thousand feet, in surrounding inter-mountain locations, contrary to some well-advised cautions from local beekeepers. I have found the somewhat harsh winter conditions (as contrasted to those in the Central Valley) as less of a threat than the unpredictability of late season honey flows which puts colonies at risk of failing to always gather sufficient winter stores. I do, however, provide upper ventilation for overwintering colonies in the mountains.

Western hives have, as a matter of standard, a 3/8" bottom opening. I am experimenting with slightly deeper entrances but can honestly say that I have encountered no significant problems with the 3/8" entrance size. Nothing I have seen here makes me think that the 3/4" opening, as used in other areas, is essential to the bees' welfare. I have yet to see numbers of bees clustered outside of the hive as I used to observe on warm, humid evenings in the Mideast. I often wonder about this.

Granted, the humidity is much less here in the upper Sacramento Valley than in the East, but the average daily temperatures are much higher than in the Midwest or East. Our summer temperatures not uncommonly rise to over 100°F for days, and even weeks in the Redding area.

I see much less swarming here than I did in the Mideast, too, and I cannot say why? I make these comments only in the context of serving as an example of how easy it is to fall into the trap of being certain of what bees actually *need*.

We use migratory hive covers here. I've seen very few telescoping metal-covered covers, with inner covers, in California, yet my colonies seem to winter well. They remain free of accumulated moisture, begin brood rearing early in the spring and build up well providing nectar and pollen is adequate or stores are available. I am quite sure western hives are as satisfactory as the eastern style hive, with the double cover arrangement, for wintering in moderate climates. Many will argue this point, I'm sure.

I have added cleats to all of my hive bodies and supers for better handling, a common practice here in the West. These handles are cut to 16-1/4" long and approximately 2" wide to

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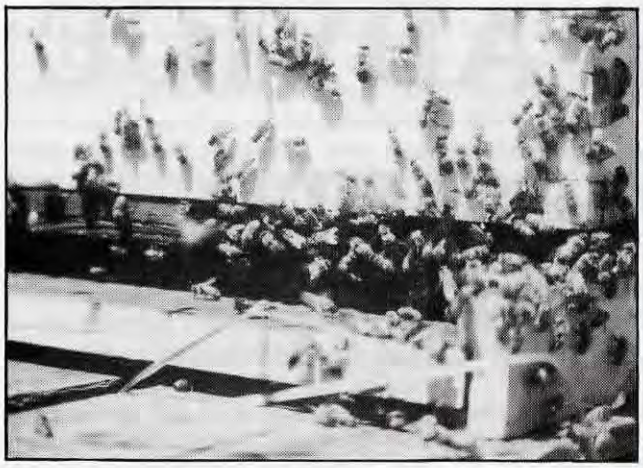
PRACTICAL ADVICE . . Cont. From Page 637



Three-eighths, vs. three-quarters — which is best?

cover the original hand holds in the front and rear of the hive bodies. I have both cleated and smooth topped hive covers but have not settled on the smooth topped covers. Cleated tops tend to begin to rot beneath the cross pieces.

I prefer standard wooden frames with solid bottombars and wedge topbars. I wire with two horizontal wires. By using vertically wired medium weight brood foundation I have a cross-wired wax base that will remain secure until it is drawn into combs. I don't believe the extra wire has been a significant deterrent to building good combs if conditions are satisfactory for comb building. My experience with plastic foundation, or other styles of frames/combs, has been limited, perhaps the reason I have had so little success the few times I have used something other than beeswax foundation. Several years ago I used an integral plastic frame and comb combination experimentally that gave quite good results.

Only vigorous colonies, working in strong honeyflow or brood rearing conditions are suitable for building good worker combs. Realistically, such conditions do not always occur. My bees are in permanent locations, as opposed to going migratory, and are subjected to highly variable honey flows. This can make comb building conditions less predictable than in the other locations I have been in. However, migratory beekeeping, for me, would create a whole new set of problems.

I keep nine frames in supers and brood boxes. I like metal frame spacers, a luxury perhaps, but no matter how carefully I try to hand space nine frames they always seem to end up out of parallel at the next inspection.

As I look back upon a fair number of years of keeping bees, I marvel at the lasting qualities of a reasonably cared for hive. For someone with the facilities it would no doubt be wise to treat new wood with a penetrating preservative. I use only a water based paint, a poor substitute for better treatment. Old time oil base paint, I found, would blister and peel during the winter. Perhaps the newer oil base paints do not. There is no problem with water base paints peeling, but the coverage is something less than good protection, largely cosmetic in purpose, I agree.

Accessory Equipment

Even with a few colonies of bees I suggest you purchase the largest smoker available. A smoker that constantly needs restoking is a great hindrance while working bees.

A hive tool is certainly a necessity. However, there are several models and sizes available, which may or may not work for you. The standard 10" model, like the large smokers, are easier to work with, but not if you have small hands. Try several, if possible.

I have the usual style of string-tied veil and hat arrangement which I find is not completely bee proof, although nearly so if properly adjusted. With the coming of the Africanized bees we may need a better arrangement. I notice increased interest in the veil and hood styles and the bee suits with a zippered veil.

Migratory covers like this work well out here. Some have a cleat in the center, but I find the wood tends to rot underneath, so I don't use the cleat.

Better protective equipment may become necessary in the future, but hopefully not at the sacrifice of more than a modicum of comfort. Our daytime summer temperatures here are very hot and I have never been able to tolerate working in a full bee suit.

Perhaps the ventilated suits are more comfortable than the suits made of solid woven fabrics. As long as I have gentle bees I hope to continue to work in short sleeves without gloves. Unlike commercial crews, who must work fast and for extended hours in apiaries, I can afford the luxury of a relatively slow pace and consequently have better control of my working conditions.

We all encounter aggressive bees at times and it is foolhardy not to carry protective clothing and gloves should they be needed. Soft leather, tightfitting gloves are best, although I could never see the purpose of the cloth gauntlets while working in long sleeved apparel. If you are cursed with a few colonies that are continuously irreconcilable, as most of us are, you need to requeen, not reinforce your protective gear. Persons working with bees daily are sometimes faced with unfavorable weather conditions or other factors that may make many of the colonies uncharacteristically ill tempered. I once attempted to approach a group of hives at a holding site to which colonies were being collected from citrus groves. A touch of insecticide may have contributed to their ill temper but to even approach these colonies not fully protected would be unthinkable.

Other Equipment

Most of us, at one time or another, need some form of transport for hauling bees, honey or equipment. Here again,

A string-tied veil works well. At least most of the time.

equipment purchases should reflect future expansion or other changes. Anyone with transportation needs beyond the capacity of the average pick-up is probably sufficiently experienced to choose wisely. For those at or below this stage of need I offer several ideas for what they may be worth.

An open bed pick-up truck is reasonably easy to load and unload. Stacks of supers and hives can be tied down. My pick-up truck has a cab (canopy) over the bed with an interior height of about four feet. This has proven both an advantage and a disadvantage. The cover has proven most helpful, almost indispensable, when taking off honey when bees are robbing; but it is a nuisance when loading and unloading supers or hauling nucs. The few times I have hauled full hives of bees has been in a two wheel trailer. The whipping action to which hives are subjected to in this mode of transport is a factor to be reckoned with. In my enclosed truck bed any escaping bees remain confined until the destination is reached, a feature that can be important if you are hauling bees through traffic or urban areas.

I have purposely avoided passing opinions on such items as queen excluders, hive stands, slatted racks, pollen traps, frame grips, various feeders and other miscellaneous items, with which I have had more or less experience. Few, if any, of the above do I now use, having concentrated on the very basic items. Perhaps I am a bit frugal. I will most certainly utilize queen excluders in the future as I will likely be using drawn comb for honey storage instead of continuously having new honey storage combs every year as in the past.

Honey Harvesting Equipment

If anything has been improved upon in recent years it is honey harvesting and processing equipment. The human perchant for "building a better mousetrap" has truly manifested itself in designing and building such pieces.

Electric powered, stainless steel basket and radial extractors, from four and six frame sizes and up, offer a range of capacities sufficient for both hobbyists and commercial beekeepers. A choice of systems, most comparatively efficient, are available for handling large volumes of honey and cappings. The principal lack, as I see it, is an integrated set of inexpensive honey handling equipment for the hobbyist and part-time beekeeper with only a moderate amount of honey to harvest. By moderate I mean from several hundred pounds to perhaps a ton or two.

The best we can do is improvise to meet our requirements and stay within a reasonable expenditure. Usually there is only minimal profit in producing and marketing a honey crop for the small producer. If you are a small producer and can afford the available honey processing equipment on profits from your honey sales, I would like to know the secret of your success.

Myself, I use a stainless steel six-frame radial extractor and a stainless steel storage and bottling tank. But, for processing honey I have improvised a heating system consisting of a galvanized tub, a hot plate and a home-made wooden cabinet for heating 60 pound cans. It's not pretty, but it works and it's inexpensive. Needless to say, a common candy thermometer is a necessary accessory.

Continued on Next Page

A pick-up works for most of us

... but a flat-bed is better for larger loads..

I attach 'handles' to all my supers. It makes them easier to lift and handle.

There is a wide choice of equipment available to the large volume producer. Most improved upon, I think, are the types of equipment that can affect the quality of the honey during processing — heaters and the like.

Plastic has its place in certain applications in bulk honey containers, bee escapes and various sundry items. Stainless steel will, in my opinion, prove a better investment over the years for extractors and honey tanks. Some hobbyists may dispute this, looking at savings at the time of purchase no small consideration for the beekeeper with only a few hives. Durable, food-safe plastic may be the material of the future. Its versatility is unquestioned and small extractor and storage tanks of plastic may be the logical alternative for the few-colony beekeeper.

Only in honey handling equipment are significant differences apparrent. We all, hobbyists, small and large producers alike use pretty much the same bees, smokers, veils, hive tools and other standard items, but we differ markedly in honey handling equipment capacities.

No beekeeper has so few bees that he or she can put up with inadequate honey harvesting and processing equipment. By inadequate I include items that are sub-par functionally as well as lacking in capacity. Few beekeepers with more than a dozen colonies, for example, seem to want less than a four frame extractor or a very small honey tank. Plan for the future by purchasing equipment that has resale value.

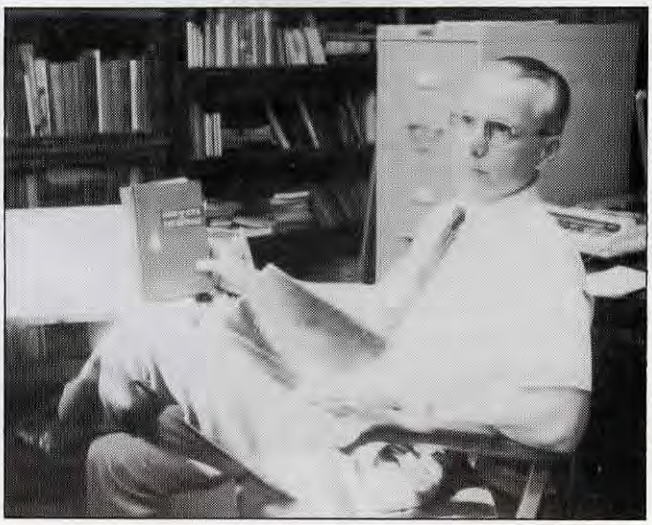
A few items are listed in every bee supply catalog that are unnecessary or unsuitable, and good advice is well worth seeking. Even though an item has been available for years from suppliers does not mean it is indispensable to the average beekeeper, and especially the beginner. Specifically, consider carefully before buying non-electrically heated uncapping knives, non-electric foundation imbedding devices and under-sized smokers, wax melters and honey tanks. Always seek the advice of experienced individuals *who have no self interest in mind.* This is one very good reason for belonging to a beekeeper's association.

Now that I have challenged nearly everyone and you think I have learned nothing at all in nearly fifty years of beekeeping I'll further appall you with a summary of what I advocate:

1. Don't, at least at first, invest in any equipment you are not positively certain is needed. If possible, consult with beekeepers more experienced than yourself.
2. Don't attempt to build wooden beehives unless you have the necessary woodworking skills, tools and machines for *precision* work.
3. Look for quality instead of economy in items you are going to depend on for long-time and dependable service, such as extractors and honey processing equipment. Improvise if necessary as a temporary measure but not at the sacrifice of safety or a reasonable measure of efficiency. Make it a point to check all available models and compare performance expectations as well as prices.
4. Beware of purchasing equipment that promises to: Dramatically reduce swarming; make home queen rearing easy; increase brood rearing by supplying some micro-element reputed to be missing in bee diets; allow you to capture swarms high in trees or from within the walls of buildings; or, promises to instantly relieve the pain of bee stings.
5. Please don't abandon or discard bee equipment around the countryside or leave stacks of supers around in the open where they can be robbed out. Take pride in the neatness of your apiaries and facilities.

"Simple things" that everyone already knows, you say. You know why I have offered these comments? It is because these many "simple" suggestions are the result of having long spurned some very good advice that could have saved me some expense and disappointments in years past. Costly mistakes need not be the *only* way to learn to judge what to buy in the market place of beekeeping equipment. □

Larry Goltz was the Editor of Bee Culture for many years, and speaks with experience on using equipment.



THE QUEEN AND YOU

SUE COBEY

THE CORDOVANS

RED BEES & PURPLE BEES

Observant beekeepers have noticed them, especially those with a history of Starline queens in their apiaries — the occasional reddish blond drones with red legs and antenna. And beekeepers working with Carniolans or Caucasians have noticed them too the occasional purplish drones with copper legs and antenna.

These are the Cordovans, mistakenly, explained as "pure" Italians or a rare stock from Greece. These uniquely colored cordovans have long amazed and delighted beekeepers.

Ever wondered where Cordovans really came from, and why they are so prevalent in U.S. bee populations? This is simply a genetic color mutation called cordovan and it can be found in various races of honey bees. Dr. Bud Cale used this as a genetic marker in the Starline Four Way Hybrid Program. Consequently, the cordovan gene (*cd*) has been widely distributed and is fairly common today.

A better understanding of the mechanics of the cordovan gene will allow you to take advantage of this interesting genetic marker. The *cd* gene is a body color mutation affecting the whole body cuticular color of the honey bee. It changes black body pigment to various shades of red and yellow resulting in this unique coloration. When introduced into Italian stock, the *cd* gene results in a blondish-red bee. When introduced into dark stock, such as Carniolans or Caucasians, the result is a purplish bronze body color.

Originally, the *cd* gene was found in Caucasian stock by Dr. W. J. Nolan in 1930. Nolan's discovery was not published until Dr. Otto Mackensen described the stock twenty years later. Mackensen introduced this gene into Italian stock producing a blondish-red bee. Experimenting with the *cd* gene in 1951, Mackensen demonstrated the trait to be recessive. He used the *cd* gene to discover the sex determination process in honey bees, a major breakthrough in honey bee genetics. Dr. Harry Laidlaw symbolized the gene "*cd*" in 1953.

The mating behavior of the honey bee and the recessive nature of the *cd* gene make it almost impossible to find a naturally occurring colony of all cordovan bees because the coloration is a recessive trait and only appears if *both* parents each pass a *cd* gene to the offspring. There the cordovan coloration is expressed only in worker bees reared from a cordovan queen mated to cordovan drones. The virgin queen must be (*cd*/*cd*) and mate with only (*cd*) drones to produce all cordovan worker bees. The odds of this in nature are extremely rare, therefore the trait must be maintained by instrumental insemination or controlled by isolated mating areas.

If a cordovan queen (*cd*/*cd*) mates with normal drones, (+), all the workers will be (*cd*/+) and have normal coloration. All the drones reared from the cordovan queen will be cordovan. Remember, drones have no father because they develop from unfertilized eggs and have only one set of chromosomes. Queens and workers develop from fertilized eggs and have two sets of chromosomes. Because the cordovan trait is recessive, both chromosomes must carry the *cd* gene for this to be expressed in queens and workers. This is why cordovan drones are somewhat common and the cordovan workers and queens are fairly rare in nature.

When a cordovan queen (*cd*/*cd*) mates with some cordovan drones (*cd*), and some normal drones (+), the color of the worker progeny in the hive will be a mixture of both cordovan (*cd*/*cd*) and normal bees which will carry the *cd*

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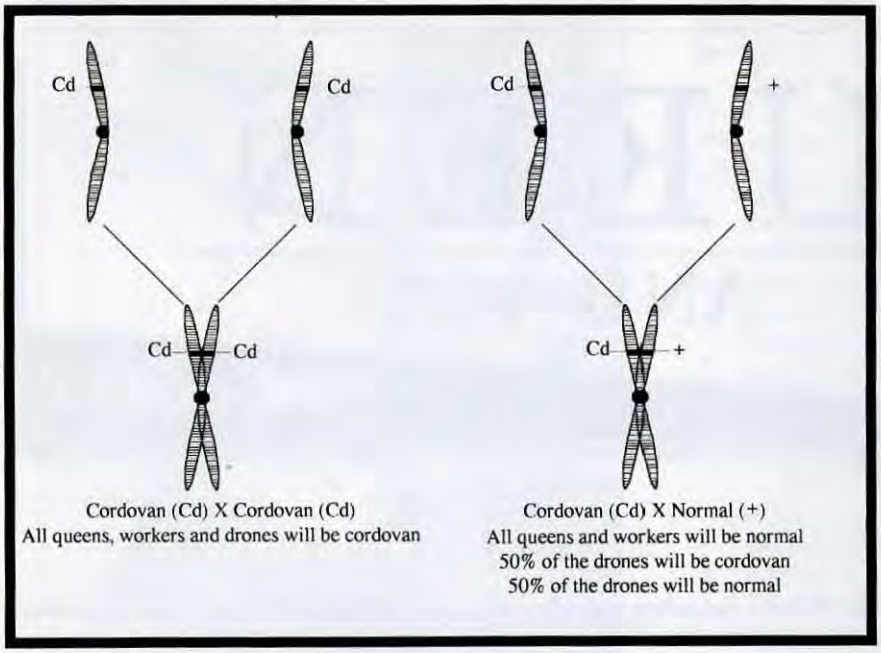

Cordovan (Cd) X Cordovan (Cd)
All queens, workers and drones will be cordovan

Cordovan (Cd) X Normal (+)
All queens and workers will be normal
50% of the drones will be cordovan
50% of the drones will be normal

gene (*cd*/+). All the drones will be cordovan. This situation is also expressed when a queen with normal coloration which carries the *cd* gene (*cd*/+) has mated with (*cd*) drones. Her worker progeny will be a mixture of cordovan worker bees (*cd*/*cd*) and normal workers bees (*cd*/+), normal carrying cordovan (*cd*/+), and normal (+/+). The drones will be a mixture of normal and cordovan. Because queens multiple mate you can develop this unique colony coloration of a salt and pepper color effect.

The *cd* gene is widely used by researchers as a marker for various studies because cordovan bees are easily distinguished from other honey bees. It has proved a valuable tool in the study of honey bee behavior and genetics. It has allowed us to understand the complex relationships between bees in a colony and how traits pass from one generation to another.

We have a better understanding of sperm utilization thanks to the *cd* gene. Research has shown that sperm stored in the queen's spermatheca after multiple mating (queens mate with 10 to 20 drones) is not completely mixed or completely layered, there is some mixing and clumping of sperm. The result is a changing ratio of subfamilies represented in the hive, subfamilies that tend to specialize in a particular behavior such as pollen collecting, house cleaning, and others.

Kinship relationships within a hive have recently become a hot topic among bee behaviorists using the *cd* gene as a marker in their studies. The workers in a colony are all sisters with many fathers displaying varying degrees of relatedness. Studies indicate that nurse bees will preferentially feed larvae from within their own subfamily verses those in more distantly related subfamilies.

The *cd* gene has been useful in mating behavior studies. Scientists have determined the distance bees will fly to mate, the distribution of drones in mating areas and the degree of genetic control in natural mating areas. The *cd* gene has also been useful in studies on pollination and foraging behavior. The unique coloration of cordovan worker bees is obvious to differentiate among foraging bees. Knowing which colony an individual bee came from allows one to determine flight distances. The cordovan bee has proved to be a valuable identifying tool for researchers.

The uniqueness of the cordovan bees offers beekeepers with an experimental nature an opportunity to learn about bee behavior and bee genetics. The cordovan is gaining renewed interest among beekeepers who want some answers. The gene can provide a means to test the degree of control commercial apiaries have over natural mating areas, determine foraging ranges, flight distances and more.

Some beekeepers like them to dazzle a friend, a customer or just themselves with the unusual beauty of these bees. The cordovans make an impressive observation hive and will take the prize at your local fair. These bees are for the beekeeper who wants something extraordinary. □

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Vaca Valley Apiaries maintained both the Italian and the Carniolan cordovans. These are being established at the Ohio State University Rothenbuhler Honey Bee Lab and will be available to the scientific community for research purposes.

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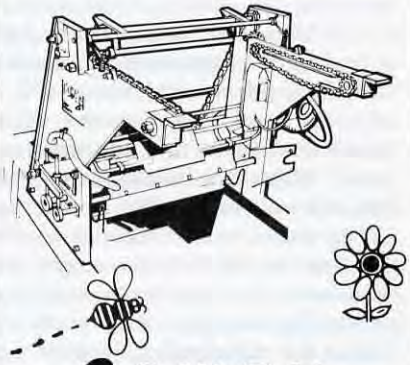

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CALIFORNIA CROP POLLINATION

Few people are aware of the relationship between honey bee pollination and their diets. Nearly one third of the produce we daily consume requires honey bee pollination. In a recent study conducted by Robinson, Nowogrodzki, and Morse of Cornell University, (*Bee Culture*, Mar '89) it was found that nearly half of the country's reported commercial crop pollination occurs in California. The values of the more important crops are listed in the Table. A description of the pollination segment of the California beekeeping industry follows.

California is located in a region with highly migratory beekeeping. "Resident" beekeepers (about 179,000 colonies) usually move among six different locations within the state each year. "Migratory" beekeepers (about 471,000 colonies) often move bees among three or four locations within the state during their six month stay, then move their bees to other states for crop pollination or honey production during the other half of the year. Limited bee pasture, especially during the prolonged annual dry season, cannot provide enough food for the resident bees, so a good deal of time, energy, and finances are devoted to feeding bees.

In The Beginning. The crop pollination year starts in early February, when at least 650,000 colonies are rented to pollinate 408,000 acres of almonds in northern and central California. Colony rental rates, averaging about $30 currently, are attractive to hobby, sideline, and commercial beekeepers. Plums bloom concurrently with almonds, thus rental prices are similar. Almond growers usually request colonies that average six frames of bees with an actively laying queen.

While this may not sound like a particularly strong overwintered colony, even that goal has been hard to reach in recent years. Poor late-summer and fall foraging conditions have been exacerbated by an "official" four year drought (the last "normal" honey crop was actually in 1982) and by the introduction of tracheal mites. Strong colonies imported from other states tend to decrease in size during winter because the bees are active but can find little food. Losses in colony numbers have been offset by increased importation of hives and by almond growers cutting back on the number of hives per acre. Suboptimal colony conditions have been offset by relatively good pollination weather conditions, in at least a portion of the Central Valley, during bloom the last couple of years.

Usually colonies build up well during almond pollination. The weather is warming, almond and weed pollens are providing excellent nutrition, and almond nectar is providing carbohydrates (almond honey is too bitter for human consumption). However, problems with agricultural chemicals can develop. If there are frequent showers, there will be frequent applications of fungicides to protect the bloom. Occasionally, this leads to bee poisoning. If the alfalfa weevil larvae get an early start in the hay fields, bee-toxic chemicals are used to depress the weevil populations. Sometimes there are no bee problems, but often the applications are being made just as the almonds are going out of bloom. Weed bloom in the hay fields is very attractive to the bees and substantial bee losses can occur.

After Almonds. Following almonds, many beekeepers move their bees to other early pollination crops, such as prunes and cherries, or move to potential honey locations. Other beekeepers move back to home locations — some for queen and packaged bee production and, in the case of migratory beekeep-

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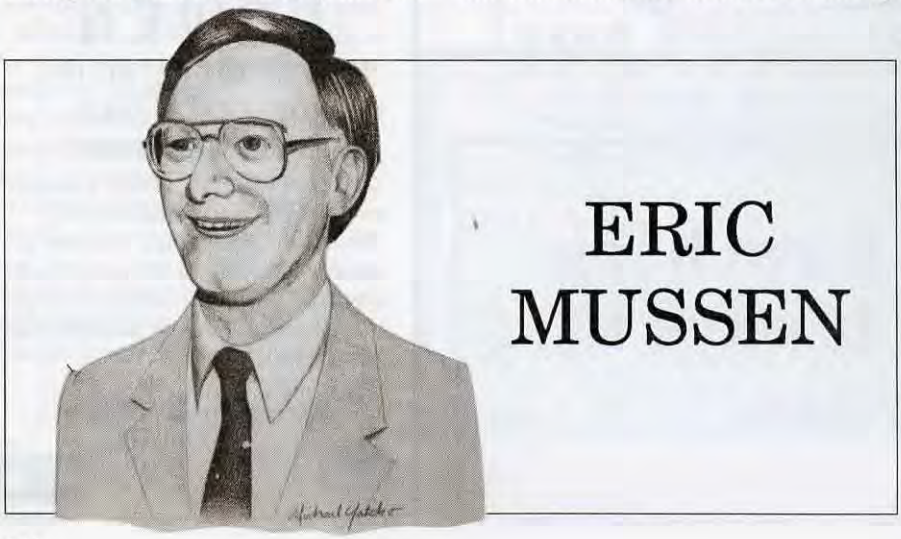

ERIC MUSSEN

•SUNSET•

When this law ends, what happens to California Beekeeping!

California claims the first county in the United States to have a law for inspecting beehives — looking for American and European foulbrood. It may soon have the distinction however, of being the first state to abandon the law providing funds for research and colony inspection. What sounds like a catastrophe, especially for migrant beekeepers, has had a stormy road almost from the start, and the finish is still in question.

Portions of the existing law state: *The beekeeper, apiary owner, apiary operator, or the person in possession of any apiary shall pay to the director an annual assessment fee not to exceed thirty five cents ($0.35) per colony as determined by the director, after consultation with the board, and input from the industry to carry out this article. However, the fee shall only be paid once each year by any one of these persons. For colonies imported into the state, the fee shall be collected at the time colonies are received in the state.*

Up until the law sunsets in January 1991, beekeepers were paying only $0.15/colony. The collected funds were used for research and to fund inspections. Anyone with less than 40 colonies was exempt from paying the fee. In another section the bill reads The department shall, from money available for the purpose in this subdivision match any funds raised by the assessments imposed under this section and deposit those matching funds in the Department of Food and Agriculture fund ...

Controversy over matching funds, how the money was spent, and if the industry was really being served by the law has split California's beekeeping community.

Because beekeepers appeared to be divided on the question of keeping the bill or having it sunset (the bill will expire on Dec. 31, 1990, and will not be renewed — the sun will set on this act) the controversy has expressed itself in a failure to keep the current law. But controversy is not new to California beekeepers. According to Len Foote, Chief of Control and Eradication, California Department of Food and Agriculture (CDFA), beekeepers have disagreed with one another on quarantines and pest abatement issues also.

A second ingredient that may have contributed to the bill's death is the political attitude in California, evidenced by passage of Proposition Thirteen, which called on the government to be more financially responsive to those it represents.

Eric Mussen, California's only State Extension Apiarist, said California wants user fees.When the bill was in full swing, the state matched funds put in by beekeepers. Mussen explained that government costs rose and the state had to put in more than their 50%. With the state's, excess contributions coming from general funds, the user fee collected from each colony became a small proportion of the overall operation of the program.

The current financial climate may have been the third factor affecting the sunset of the bill. The legislature was addressing programs funded from the general fund, and heard from (some) beekeepers that the law was no longer needed. The legislature immediately saw one program it could do away with without too many people complaining.

A quick review of California's beekeeping laws may be helpful in understanding what is happening now.

In 1877, San Bernardino County was the first county in the United States to have a bee law, asking for inspections to protect against American and European foulbrood. In 1883, county Boards of Supervisors could appoint bee inspectors and establish their salaries.

The Apiary Protection Act of 1927 was passed to eradicate American foulbrood in the state by the CDFA. This program was funded through the general fund. By 1928 14,000 diseased colonies had been burned because of this program. By the following season, the program succeeded in cleaning up 27 of 54 counties. By 1932, only one percent were found infected, and that level was held.

Between 1965 and 1969, a legislative analyst reviewed all programs in California to discover how they were funded, and recommended those receiving service should pay for the service — the bee industry should pay for their programs.

Foote explained that the legislature held off for four years having the bee industry fund their own programs because of the consumer benefits of bees and beekeeping.

But in 1970 the legislature finally took apiary programs out of the general fund and scheduled them to terminate on June 30, 1972. Representatives of the beekeeping industry met with the director of agriculture, who agreed that if the bee industry would pay *one third* the cost of the program, he would fund the remainder. It took a year to get the assessment program in place, and by 1972, the Apiary Board and assessment program were funding the required one third.

During 1976-77, county governments experienced funding problems and in 1978 the infamous Proposition 13 appeared, cutting county funding and nearly scrubbing the bee program. Beekeepers revised their structure and paid 50% of the program and it has remained this way.

Foote explained the current split in the industry as one group not want-

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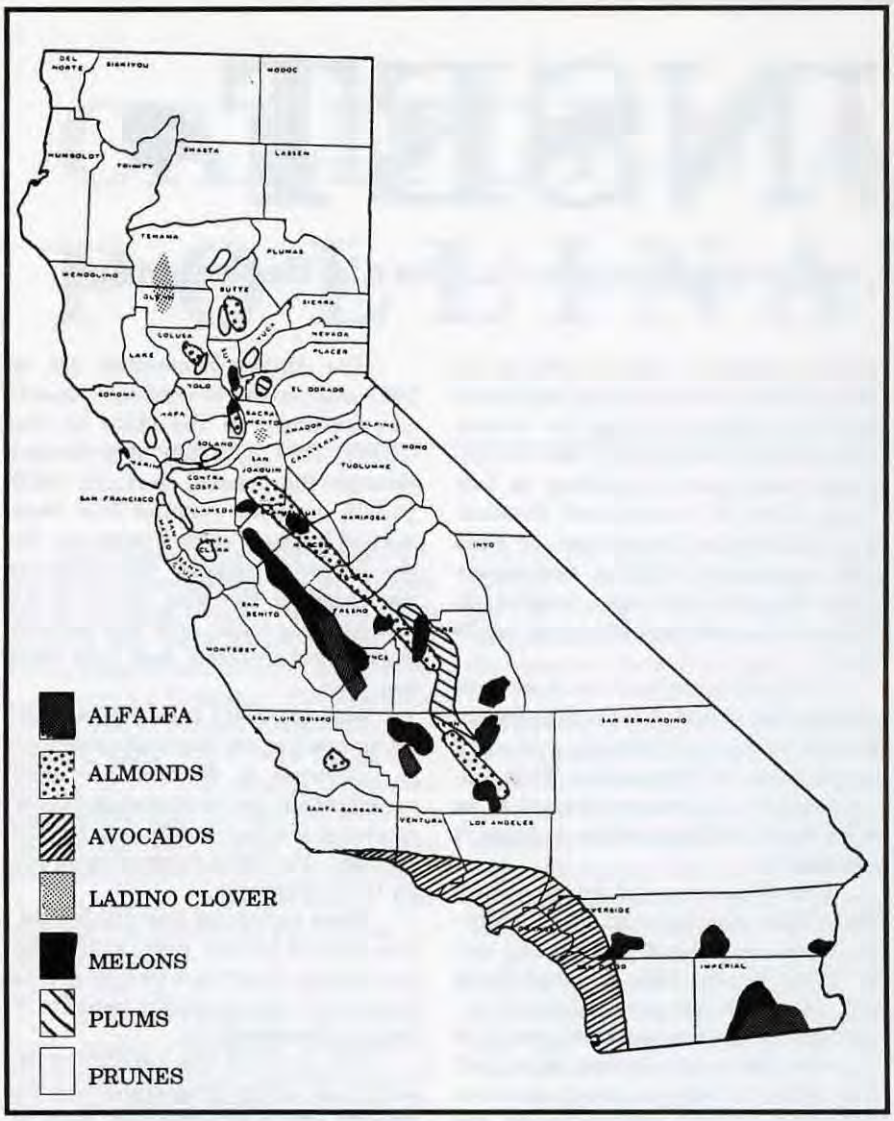

CALIFORNIA . . . Cont. from Page 644

ers, for honey crops in other states. Prices for colony rentals plummet for later crops, since the demand for bees is nowhere near what it was for almonds.

California is the nation's leader in production of hybrid oil, forage and vegetable seed crops. Due to specific growing conditions, California growers can produce substantial crops of high quality seeds on relatively small acreages. Honey bees are rented throughout the summer months for seed pollination, but prices tend to be depressed by the large supply of colonies.

During the summer, demand for bees increases when alfalfa seed fields and melons come into bloom. Growers prefer to rent colonies with at least 800-1000 square inches of brood and are willing to pay around $20 per colony. Honey bees are not efficient pollinators of alfalfa. Only one flower out of every hundred visited is "tripped," so the fields must be saturated with honey bees for up to ten weeks. Many fields are section plantings (640 acres — one square mile) and require around three colonies per acre. Thus, each field has nearly 2000 colonies of bees in it. Besides being short on food, 1) water must be supplied to the bees in barrels, 2) drifting is a serious problem, 3) colony attempts at supersedure usually fail, 4) spread of diseases and parasites is increased, and 5) insecticides are used on the crop to mitigate pest problems.

After a reasonable start, and production of some honey, it is expected that the colonies will decline rather badly during the ten week pollination season. This necessitates building the colonies back up in order to be useful for almond pollination the following spring.

Low Prices. Melon pollination, although large in acreage, requires only a few weeks per field. Often beekeepers will provide bees for melon pollination at incredibly low prices simply to have: 1) a relatively safe place to locate the bees, 2) a location where the bees can feed themselves for a while, and 3) a chance to obtain a bit of cash to ease a cash flow problem. Whatever the reason, the net result is to lower the prices to everyone at a time when beekeepers are barely making ends meet, if they are lucky.

Following their use in crop pollination, the colonies are moved to fall build-up locations. Late blooming wildflowers, like tarweed and bluecurls, have been relied upon to provide food for rebuilding colony populations. In recent years, beekeepers have been lucky to find specimen plants of those species in the field. Heavy feeding with sugar syrup and pollen substitutes or supplements have replaced making fall divides. Under these stressful conditions, many colonies have been lost to malnutrition and infestations of tracheal mites.

Because of these factors, California beekeepers are going to have to raise their prices for crop pollination during the summer months, if they intend to survive economically in the pollination business. □

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California Pollination Statistics

Crop	Acres	Value (year)
alfalfa seed	67,000	$ 42,703,000 (88)
almonds	408,000	471,500,000 (89)
apples	24,000	96,200,000 (89)
avocados	74,500	200,490,000 (89)
bushberries	2,160	24,108,000 (89)
cherries	10,200	24,418,000 (89)
cucumbers	4,300	12,958,000 (89)
kiwi	7,100	26,565,000 (89)
melons	107,500	257,296,000 (89)
pears	20,400	79,305,000 (89)
plums	41,000	94,796,000 (89)
prunes	77,300	150,000,000 (89)
safflower	100,000	27,000,000 (87)
tangerines	7,900	28,862,000 (89)
		$1,536,201,000 (89)

Sources: California Field Crop Statistics
California Vegetable Crops
California Fruit and Nut Statistics

All published by the California Agricultural Statistics Service.

California Crops Pollinated By Honey Bees

	Crops Dependent[1]		Crops Increased[2]
Forage Seed Crops	Alfalfa	Redclover	Crimson clover
	Alsike	Sanfoin	
	Berseem	Crown vetch	
	Birdsfoot trefoil	Vetch (purple,	
	Ladino clover	common & hairy)	
Veg. Seed Crops	Asparagus	Leek	Eggplant
	Broccoli	Melon	
	Brussels sprouts	Mustard	
	Cabbage	Onion	
	Carrot	Parsley	
	Cauliflower	Parsnip	
	Celery	Pumpkin	
	Chinese cabbage	Radish	
	Collards	Rutabaga	
	Cucumber	Squash	
	Kale	Turnip	
	Kohlrabi	Watermelon	

[1]These are unable to produce a commercial crop without cross-pollination.
[2]These generally produce a larger crop when honey bee-pollinated.

From: *Honey Bee Pollination in California*, 1975. Ward Stanger, Robbin Thorp, and Len Foote. 75-6E/2243, Division of Agricultural Sciences, Unitersity of California, Berkeley, CA.

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ing regulations, while another does. He says the split is pretty even in numbers.

When asked, Jim Robertson, Vice President of the California State Beekeepers Association, stressed that his opinion is not that of the association.

"From the beginning," Robertson said, "salaries were paid, overhead was covered and collectors collected and kept the money. Some went to research," he said, but he feels something else was wrong because there were three program directors in four years. He explained that Directors are political appointments and The Apiary Board could only advise a Director on an issue, then the director may "do as he pleases." The Apiary Board is, however, the recommending body for the use of money. The California State Beekeepers Association was assured that it could select a candidate for the position of director. The assistant Director is a civil servant.

Early on in the program, the charge per beekeeping outfit was changed to a per colony charge. If a beekeeper had 1,500 hives, he may have paid anywhere from $65, to $200, according to Robertson. "We were supposed to get more research with the per colony charge," he added.

At the California State Beekeepers annual meeting last year, the board voted to support the continuance of the program, according to Robertson. "Six bee clubs opposed it and one supported it, so those that opposed it sent members to the legislature to voice their opinions," said Robertson.

Currently, the California State Beekeepers, according to Robertson, wish to continue research, instead of mandatory collection. "Out of $90,000 a year, only $7,000 was spent for research. Some personnel who were paid by the assessment were actually working on the med fly this year, and only gave a small amount of time to bees," he continued.

Brian Ferguson, of Huston Ferguson Apiaries, looks at the bill the way it was written, with the clause to sunset every two years. "It's unusual to have a law written like that, but the author of the bill was persuaded to include the clause," said Ferguson.

"The state spent two to three years struggling to put it all together, and there were some descenters at the be-

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ginning. The State Association may have been remiss in not starting years earlier in dealing with inspections," said Darrell Wenner, Wenner Honey Farms and president of the California Beekeepers Association. "It was discussed at board meetings this year. The association even went to the legislature for a one year extension for additional time to discuss it and bring it back to members, but the opposition had it killed in committee. There's little likelihood the association will try to start anything up this year," he added. Wenner credits the opposition as being several beekeeping clubs in the San Joaquin Valley.

James Bach, State Apiarist for Washington State and president of The Apiary Inspectors of America (AIA), who expects some impact on his state because of the sunset, said, "The agencies have not properly communicated with the beekeepers and the beekeepers haven't communicated with the CDFA."

The final word for what has happened is summed up by Foote, "The industry says deregulate — so we deregulate."

But the ramifications of this action stretch far beyond the six clubs who opposed the program.

Inspections are not only for those who keep bees in California. Each year, thousands and thousands of colonies are brought into the state to pollinate almonds and other crops. Up until now each county has had a bee inspector, and even without a state coordinated program this should remain the same, but if a county chooses not to have a bee inspector and migrant bees need to come into or go out of that county what does the beekeeper do? Darrell Wenner said "The counties may continue inspection, but 50% of them don't want to."

Mussen says beekeepers may simply have to move into counties that have inspections, with added expense and time.

Bach reports that this "patchwork inspection" could jeopardize the Western States Varroa Agreement. "We want to keep the pest eradication and CDFA involved. The ideal is to have one inspection and certification, go to the *state* they need to travel to and come back to their home state."

The rest of the country will be watching California

Washington ships bees to anywhere from 10 to 16 counties in California, a mixing state, where bees from all over the country become mixed up during pollination.

Ferguson suggested closing California's borders to bees and within two years, there would be enough bees for pollination without bringing in migrants. But then he asks, "What do you do with the bees in the summer? You can't keep feeding them."

And then there's the question of the Africanized bee coming into California. What will "patchwork inspections" mean to Africanized management? Mussen looks to each individual county for control measures. "It may take each county's ordinances to solve the Africanized bee problem. Ordinances can vary, especially the wording, and beekeepers will have to deal with each county's different opinions," he said.

Wenner added that "If the Africanized bee comes to California, it will probably have a quarantine slapped on it and come under pest control." And Ferguson felt that the Africanized bee was nonsense. "The fear isn't bees, but with the regulatory agencies dealing with the bees," he added.

The three cents per colony collected for Africanized bee research each year will continue until 1992 and there is currently a reserve in the fund. Opinions differ as to whether it is economically feasible to continue to collect that fee. The reserve could carry the program for another five years, according to Mussen. Funds are also matched by the Almond Board and other commodities, who could become the collection agency should the state not collect. "If everyone continues to send in their money — it will continue," said Mussen. He also commented that there is a 'change over time' in this industry. Many states are waiting to see if California becomes more lax in its laws."

Darrel Wenner reminds beekeepers that the inspection procedures could affect the package and queen industry too, and asks, "Will counties do the inspection of these also?"

Foote raises a question that is common to beekeepers, "I manage my bees well, but I'm a little concerned about my neighbor's bees." A beekeeper can only inspect his bees, inspectors must deal with someone else's colonies.

That suspicion arises from the

Continued on Next Page

threat of disease. If you are managing you bees well and keeping an eye out for problems, what if your neighbor is ignoring trouble in his colonies that might spread to yours? More than one expert has voiced the opinion that the use of chemicals may increase to beyond allowable limits with "patchwork inspection." Bach foresees beekeepers using Apistan (Apistan® Strips) for prevention (of varroa mites), in addition to treatment. But if chemicals aren't used, Bach predicts a higher level of pests.

Speculation ranges across the board, with some crying gloom and doom for the bee industry in California, while others look at it as a new beginning after having revamped their programs. Wenner states, "We may have thrown the baby out with the bathwater," and Mussen reports, "changes have to be made in what the beekeeper wants in regulation programs."

Meanwhile Ferguson doesn't see much of a change, "Everything should go fine. The state may want to drop their functions, but laws mandate them to continue." Bach agrees, "The government has the responsibility to maintain the health of agriculture. It has a responsibility to other agricultural activities and to the people."

Robertson said that the sunset of this bee law will have no bearing on any existing bee laws or inspection, only on collection of the assessment that was supposed to be for research. Ninety-five percent of the bee law will be the same. The state may say that it is 'pay back' time and pull state inspectors, but the laws on the books say they have to inspect. So they probably will," he said.

As California sorts this out, the rest of the country will be watching and perhaps start to evaluate their own bee laws. If nothing else, California has made all beekeepers take notice of what is happening in their state, and what may need to be changed.

"Beekeepers, given full information, can make good decisions," said Darrel Wenner. The U.S. beekeeping industry may be dependent on that premise. □

Written by
Pamela Moore

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STRESS AND HONEY BEES

ERIC H. ERICKSON

Few beekeepers question whether their systems of bee breeding and colony management adversely affect the normal biological processes of honey bees. And even fewer consider assuring that the environment within the hive is "natural" — as close as possible to that which is optimal for honey bee survival. It seems that we have come to expect that honey bee colonies are generic and are only found in nearly square white boxes just as children believe that milk comes from paper or plastic containers. The fact is, of course, that before the intervention of beekeepers, feral (wild) honey bees were (and still are) highly adapted to native habitats and utilize as domiciles naturally occurring cavities in living trees, rock crevices, ground holes and other similar spaces. As beekeepers, we assume that the white boxes we provide as hives are somehow adequate if not better than natural cavities. We find it difficult to understand why, given our breeding and management strategies, our bees are often unable to withstand the onslaughts of weather, diseases, mites and perhaps even the incursion of Africanized bees. The fact is that from the very moment we place bees in artificial wooden hives, we impose upon them a large measure of stress.

Natural ...

When a honey bee swarm exits a natural cavity in search of a new domicile, it is, under normal circumstances, guided entirely by its own instincts. It exercises these instincts in the selection of a well insulated, properly sized cavity. Herein it builds comb using inherent skills. The attachment of these combs to the interior ceiling and walls of the cavity as well as a small upper entrance establishes relatively stable thermal and humidity zones for brood rearing and communication. This construction greatly restricts the movement of bees, air and hive odors. The newly founded colony will rear its young, establish its own defenses against enemies (diseases, parasites and predators) and gather and store provisions in a manner that ensures a nutritionally adequate and well balanced diet. If it fails in these endeavors, for whatever reason, the population declines and with continued failure, dies. Shortly thereafter, wax moths move in to clean (by destroying the combs) and restore the cavity to its nearly original state.

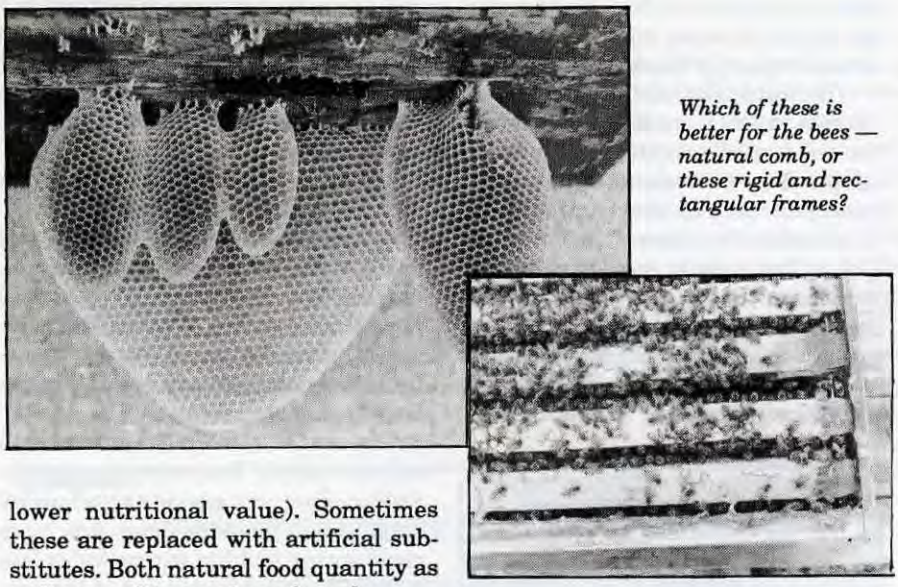
Are white wooden boxes really good for bees?

This housekeeping force readies the cavity for the next swarm. In this natural scenario, three biological facts are evident: 1) environmental stress imposed on this colony is minimal; 2) colonies with genetic composition that reduces fitness for survival are quickly eliminated, often before they can produce drones; and 3) wax moths are beneficial insects that eliminate old and perhaps contaminated food stores, toxins and disease organisms. This cavity restoration assures that new swarms construct new, uncontaminated combs for brood rearing and food storage.

... Artificial

But then mankind, as a not-so-benevolent keeper of bees, enters the scene and, usually unknowingly, imposes stress. The beekeeper captures that swarm, hives it in an uninsulated, free standing, oversized box and forces it to build comb. The cells may be highly variable in size depending on the foundation used. The flow of interior air and hive odors is greatly increased by the additional space around removeable frames and between hive bodies and by an enlarged entrance placed at the bottom. This results in increased energy expenditure by the bees for temperature and humidity control.

The bees are subjected to management schemes that result in exorbitantly large populations and the removal of excessive quantities of pollen and/or honey. The beekeeper alters the diet of the colony first by stimulating increased levels of foraging and brood rearing and then by selectively removing pollen and honey (e.g. early season honey and/or pollen and leaving only late season stores which often have



Which of these is better for the bees — natural comb, or these rigid and rectangular frames?

lower nutritional value). Sometimes these are replaced with artificial substitutes. Both natural food quantity as well as quality are thus altered.

Old, dark combs, usually contaminated by continuous exposure to naturally-occurring microbes, plant toxins and man-made pesticides, may be kept for thirty years or more. The bees are bred for behavioral traits foreign to their survival (but in harmony with their current environment) and are subjected, often unprotected (except for an uninsulated box), to the environmental extremes of winter cold, desert heat and/or more pesticides.

In this man-made scenario three facts, entirely different from the natural scenario above, are evident: 1) domestic honey bee colonies in box hives are subjected to stresses seldom encountered in nature; 2) domestic colonies whose genetic fitness may be reduced are nursed along, often unknowingly, so that undesirable genes may be perpetuated; and 3) housekeeping chores normally carried out by wax moths are added to the responsibilities of worker bees or remain undone. Thus, toxins, disease organisms and other undesirable elements of the environment often accumulate in the hive for many years, further reducing the ability of the colony to function normally. The wonder then is not that so many domestic colonies dwindle or succumb for whatever reason, but rather that so many survive in spite of beekeepers!

It is upon this latter point that we must learn to focus if we are to understand honey bee stress and then reduce it. Remember that bees function like other insects, mammals and even human beings. They learn and remember via both short- and long-term memory but can be confused by exceptional or adverse elements. For example, they sense and respond to their environment, but they can adapt only within certain limits and thus may become chilled or overheated. They function less efficiently under nutritional stress and their immune system can be compromised by toxic elements in the environment. The task is to recognize stress when it occurs in domestic colonies and then to assist our bees through difficult times.

STRESS

Stress as it occurs in honey bees is still poorly defined. To evaluate fully the effects of honey bee stress inducers, we need to know much more than we presently do about the natural biology of honey bees. Having said this, however, let us examine in detail what we know and can presume about several probable sources of honey bee stress.

CLIMATE, WEATHER AND THE BOX HIVE. Among the elements stressing honey bees, few ravage domestic colonies more than the weather. While feral colonies are for the most part comfortable within their natural cavities, domestic colonies in uninsulated hives must struggle to survive the seasonal extremes of cold winters and hot summers. If they survive, and many do not, their productivity is significantly reduced. This is not to say that feral colonies are not affected by seasonal and climatic change — they probably are, but undoubtedly to a far lesser degree due to the factors discussed below. They survive, in part, because they still have the tools, acquired through millennia of evolution, to cope with hardship.

In a living tree, the honey bee colony is surrounded (usually) by several inches of heart and sap wood plus a layer of living tissue (the cambium) and bark. The R value (1 divided by the thermal conductivity of the material) for the cavity walls in a living tree likely falls between 5 and 15 and perhaps higher, although precise measurements are unavailable. The R factor for a one-inch pine board (which is actually about 0.75 inch) is 1, essentially zero insulation (Wheast, 1980). Hence, the R factor for a box hive is far different from that of the typical feral colony. (Note: the R value for walls in new homes in many areas of the United is R=19). The living tissue surrounding the tree cavity generates some heat from metabolic processes. Moreover, the cells of the cambium carry cool water from the soil to the tree top, a function that likely thermally stabilizes or cools the cavity slightly in summer. In the winter, the cambium is supercooled but not frozen, thus contributing insulation in addition to that of the cavity wall. In those areas of the world where there are few if any trees large enough to accommodate a colony, honey bees utilize rock crevices and ground holes. The surrounding rock soil mass is a virtually unlimited thermal (and humidity) buffer for these small caves, a point more easily understood when one feels the air expelled at the entrance to a large underground cavern in mid-summer or mid-winter.

Studies have shown that the temperature inside an uninsulated box hive differs little from ambient temperature (Owens, 1971). Thus, depending on locality, internal hive temperatures outside of the cluster may range from -30°F (-34°C) to 115°F (46°C). This potential 145°F (70°C) temperature range is undoubtedly far different than that of natural cavities which probably vary by no more than plus or minus 30°F (17°C). This concept is strengthened by the work of Severson and Erickson (1985) who showed that in Wisconsin the colonies' consumption of honey for the production of heat does not vary with the severity of ambient winter temperatures. Thus, one must assume that once the heating mechanism reaches maximum output, all the bees can do to survive increasingly cold conditions is to tighten the cluster. Other work (Erickson, unpublished) indicates that during brood rearing,

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worker bees maintain absolute humidity at near saturation within the brood nest. During the winter months, the humidity within the cluster is only slightly lower. Since both heat and moisture production are accomplished via the metabolism of honey, it must be assumed that both honey stores and the physiological strength of bees are unnecessarily reduced during winter in the uninsulated cavities of box hives.

Several studies have shown that honey bees can compensate for and survive temperature extremes. However, what such studies have not considered is the drain on the physiological resources of the colony. The effects of this stress may well be significant in terms of reduced brood rearing or foraging and shortened worker bee life span.

COLONY SIZE. The number of honey bees in a normal feral colony varies from about 14,000 to 25,000 (Seeley and Morse, 1976). Beekeepers, using a variety of strategies, are able to increase managed populations to approximately 60,000 (Farrar, 1968). These strategies include increasing available brood nest space (e.g. cavity size), reversing the brood nest, stimulative feeding and breeding honey bee stocks for increased brood production.

The basic design of the Langstroth hive may also contribute to the increased size of managed populations. For example, the spaces created by the development of the moveable frame greatly alters air flow patterns within the hive. This increase in the potential for air movement is further enhanced by beekeeper efforts to ventilate hives and provide a greatly enlarged entrance relocated at the bottom of the cavity. Conversely, the natural cavity that the bees choose has combs that are attached to the ceiling and walls. Air exchange is restricted between the large, undulating, pendulous combs. Ventilation is greatly reduced by an upper (usually) entrance, generally a tiny knothole, crack or crevice (Avitabile et al, 1978).

We know that colony integrity is maintained, at least in part, by pheromones those chemicals produced externally by bees (Gary, 1975). Gaseous products of in-hive metabolism, such as water, ethylene and carbon dioxide may also regulate bee activity and behavior. Therefore, it is reasonable to assume that excessive air circulation within the box hive and ventilation at the entrance significantly alter concentrations of these bioregulators.

It is argued that in cold climates, colonies must be ventilated to prevent the build-up of moisture and ice in the colony. But, this excess water is the product of condensation on the uninsulated walls of box hives (Detroy et. al., 1982). Thus, both condensation and ventilation draw moisture from the cluster, stressing the bees by causing them to step up the metabolism of honey to maintain both temperature and humidity in their "comfort zone"

Do bees spend an inordinate amount of time, and energy, ventilating man-made hives?

COMB CELL SIZE. Unbeknownst to most beekeepers, the issue of the relative size of the cells of honeycomb (and foundation) has been the subject of controversy since the late 1800s and perhaps earlier (Erickson et al., 1990) when, in Europe, the diameter of the raised imprint of the cell on manufactured foundation was 5.0 mm. However, Baudoux, beginning in the late 1800s, conducted a series of experiments which demonstrated that this smaller than natural size induced developmental abnormalities in bees and reduced colony productivity.

In further experiments, he demonstrated that larger bees with longer tongues could be produced in abnormally large (6.0 mm diameter) cells. Finally, he purported to show that this increased size would result in greater colony productivity and that the size of bees in subsequent generations would be inherited. Baudoux's latter two views have since been debunked. More recent studies (Grout, 1937) failed to provide scientific evidence for increased honey production by colonies with bees produced in larger cells.

What has emerged from all of this is the concept that bigger is better — but is it? The current industry standard for cell size on manufactured foundation is 5.4 mm or larger. But the diameter of cells instinctively built by honey bees is slightly less than 5.2 mm (see Erickson et. al., 1990). The difference in cell size means that more bees can be produced per unit area in a brood nest of small cells. This translates into more rapid spring buildup and probably less metabolic energy expended in the production of each bee. It might also result in a shortened time for larval/pupal development.

Here, the issue of stress must again be raised. Do enlarged cells stress bees just as Baudoux demonstrated for abnormally small cells (see Erickson et al., 1990)? Could nutritional, wintering, disease and mite problems be reduced by returning to natural cell size at least in brood nest combs?

COMB AGE. Beekeepers usually prefer to retain the old combs in their hives for many (20 to 40) years as opposed to replacing them. They believe that the process of comb building, the conversion of honey into wax, significantly reduces net colony honey production. However, I am unaware of any scientific data to support this contention.

The honey produced in old, dark comb is usually darker in color, and the bees may be smaller due to residue buildup within the cells. Many organic molecules and most pesticides are lipophillic (fat and wax "loving"). This, of course, includes beeswax which is one of the most efficient waxes in this regard. Because of their high lipid affinity, many toxic and potentially hazardous substances from the environment are bound up in beeswax combs. Thus, it can be argued that the wax produced by bees serves as the "liver" of the colony by providing a natural cleaning mechanism in the hive. Such a mechanism would ensure a clean environment for brood rearing and supply of healthy, palatable food; but the ability of wax combs to absorb toxicants is not unlimited. Hence, the struggle to keep colonies vigorous on old combs seems

much like trying to keep a patient alive with a cirrhotic liver. It is likely that the perceived savings from the retention of old combs would be more than offset when new combs increase the productivity of healthy colonies and reduce reliance on medications and supplemental feeding. This has long been the contention of Mr. Glen Stanley, Des Moines, Iowa (pers. comm.).

Like all worlds, that of the honey bee is filled with hazards not the least of which are naturally occurring toxins. There are, for example, toxins in the nectar and pollen of some plants as well as toxins produced externally by fungi that may develop on these floral products. Still, bees gather these materials, usually without harmful side effects. Perhaps, if we understand all of the natural mechanisms like beeswax that protect bees from such toxins, we may be able to utilize these to protect our colonies from pesticides and other man-made chemical hazards.

PROPOLIS. Propolis is an admixture of plant resins, beeswax and hive debris. Worker bees use some kind of solvent, probably glandular in origin, to mix these materials into the familiar brown, sticky substance that many beekeepers find objectionable. Strains of bees that produce very little propolis have been developed.

Propolis is likely highly beneficial to bees because it contains antimicrobial chemicals called terpenes. Terpenes such as pinene, limonene and geraniol, just to name a few, are well known bacteriocides, fungicides and miticides. Such terpenes have been shown to be of great importance in the biologies of other insects. Thus, one can readily speculate that the reduction of propolis in domestic bee hives may have rendered our colonies more susceptible to diseases and mite infestations.

BIGGER BEES. Honey bees have been selectively bred for centuries. Among the many traits that have been altered or enhanced are productivity, gentleness, color and size. Unfortunately, every artificial selection and breeding program has its inherent risks because enhancement of one trait can, and often does, lead to the loss of others — such as reproductive advantage and natural immunity. Frequently, such a loss goes unnoted for many generations, and usually it is not until calamity befalls the population that the loss is recognized.

Space does not permit discussion of the many potential shortfalls that may emanate from past and current breeding programs. However, it is timely to address one, perhaps misguided, selection effort breeding larger bees. As previously noted, beekeeper preoccupation with large bees is longstanding; and while size is, in part, a function of relative comb cell size, there is also a large heritable component. Thus, today we have larger queens producing larger workers in larger cells.

The question that must be asked is "do larger bees require a longer developmental period?" If so, what then is the impact on colony vitality, particularly population size, worker bee replacement rates, efficiency of brood food utilization, susceptibility to diseases and mites, as well as efficient heating of the brood nest? The issue of bee size deserves extensive study, particularly in regard to alteration of the impact of stress-inducing environmental hazards on populations of honey bees! For example, are larger bees more or less susceptible to temperature or humidity extremes, and pesticides?

"Beekeepers all too often unnecessarily stress their bees"

FORAGE RESOURCES. The single most important factor limiting the growth, development and productivity of an otherwise normal honey bee colony is the availability of pollen and nectar. The plant ecosystem (not the beekeeper) drives all aspects of colony development and performance. Some plant species or cultivated varieties naturally produce greater quantities of nectar and pollen. Even so, plants stressed by water, light or nutritional deficiencies may limit or cease production of nectar and pollen, thus stressing nearby colonies.

Honey bees require a balanced diet. Since few, if any, single species of pollen are nutritionally complete bee diets, plant species diversity is essen-

Continued on Page 654

Do big cells mean more honey?

STRESS . Cont. From Page 653

tial for development of healthy, vigorous colonies. Frequently, this diversity is lost in areas suffering from drought and where monoculture is practiced on weed-free farms. Plant stress may also lower the nutritional value of the floral reward, either nectar of pollen. As a result of any of these conditions, colonies may dwindle. The best adapted and otherwise unstressed colonies will survive longest on the resources of environmentally-stressed plants.

Finally, the ease with which bees can forage successfully within a patch of flowers is well recognized. Flower accessibility is important, but all to often, beekeepers fail to recognize that the nearer their colonies are to floral resources, the more efficiently those resources will be harvested. The issue is simple — the farther a colony must fly to gather nectar, the more honey it will use as fuel. Equivalent flight miles per gallon of honey (km per liter) can be easily calculated for a bee or a colony (ca. seven million MPG). Wear and tear on the bee is also important.Bees only fly an average of about 140 miles (ca. 240 km) up to a maximum of 500 miles (800 km) in a lifetime before wearing out (Neukirch, 1982). Thus, while bees may forage at distances of up to five miles from the hive, such distances reduce foraging efficiency and the working life of the bee.

THE ENEMY. The honey bee colony has a number of natural stress inducers and enemies including weather, natural disasters, predators, parasites and diseass. The latter are well described in the book edited by Morse (1990). However, none of these inflict as much stress on the domestic colony as the beekeeper.

My purpose in writing this article is simply to emphasize the fact, as stated in the opening paragraph, that beekeepers all too often unnecessarily stress their bees. Hopefully, by drawing attention to some of the little recognized but significant sources of honey bee stress, beekeepers around the world will be able to improve their colony management strategies and hence their profits. □

"Weather, cell size, available resources, and beekeepers all play a role in honey bee stress. Perhaps beekeepers the most."

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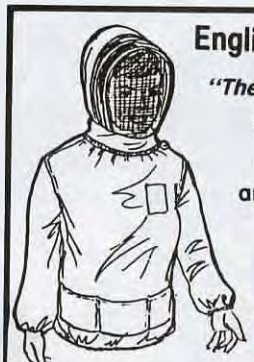

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OK in OKLAHOMA

KIM FLOTTUM

Ross Honey Co. is doing O.K., and the future looks even better.

Ross Honey Company is the largest beekeeping outfit in Oklahoma, with about 1100 full sized colonies, and enough nucs and splits to make up normal winter loss, and add another 8-10% next year.

Jim Ross, co-owner with his wife Glenda, keeps about a third of his bees within a half day's drive of home, which is about 40 miles out of Oklahoma City. The rest are down in the far southwest part of the state, near the Texas panhandle.

Ross Honey Company has been particularly successful at marketing the 200 or so barrels of honey they produce each year, plus the 40-60 they need to buy just to meet the demand they have created.

"Before you can talk about how your honey sells, though," says Ross, "you've got to back up a bit and take a look at how that product is produced.

"Without quality material", he said, "you're just not going to sell honey. Period!!"

So last July we took a look at how Ross Honey handles the 130,000 pounds of honey they produce each year, and what they do with it once it's bottled, labeled and ready to go.

"Our quality control starts right in the bee yard," Jim said. "We stack harvested supers (they remove bees with fume boards) on what we call a 'super pallet'. But before even one super goes on, we put down a sheet of butcher paper. This keeps any honey from leaking out and getting the trailer bed sticky," he said, "and cuts down on robbing, too."

Ross then sticks seven supers on this little pallet, puts on *another* sheet of butcher paper, then adds a cover to the whole stack.

"The pallet, paper and cover are the 'extras' we do to keep bees out, and to keep our truck and trailer and honey house as neat and clean as possible," Ross stated.

Ross's have a medium size flat bed, and can haul a double axle goose neck trailer. "We made the second axle ourselves, because we're always loading the trailer full-up, and kept blowing tires," Jim said. "It can hold 280 shallow supers, (40 stacks of seven high) which is perfect, because everything we use is in shallows."

Once the supers have been brought

A typical outyard near home.

"We've fixed it now so we can bulk feed bees in a barrel without having thousands drown"

The storage area, truck with trailer and quonsethut honey house and office.

back to the storage room, attached to the Quonsethut style honey house, they are unloaded and stacked for easy moving to the extraction area.

Extraction starts with a Bogenshutz uncapper, one mean machine for this task.

The principle behind this machine is fairly simple, but the power that runs it is incredible. Similar to newer styles, a frame moves downward between two uncapping units, one on each side of the frame. But rather than hot vibrating knives, or flailing chains, there are on each side four extremely sharp blades, attached to a shaft which rotates at 1,725 RPM.

"The machine was new in 1956, but since that time we've added shear pins to the blades, because they would jam when they hit an odd size frame", said Jim.

"Still, with a 3/4 horse motor running each shaft, and the heavy duty blades attached, we tend to weed out our oldest and least desirable frames each year anyway," he noted.

"But when it's running smoothly we'll go through 12 frames a minute, which is faster than I can load when I'm running smooth," he added.

After the frames are uncapped, they run down the tray section, where excess wax and honey can safely fall. All the cappings wax, from the uncapper and the tray are eventually carried to a wax spinner, where the honey is removed and the wax stays.

Meanwhile, frames are unloaded from the uncapping tray and loaded into one of two Root Simplicity Extractors (one made in 1918, the other in 1946). Both have been modified somewhat, but hold about 50 frames each.

Extracted honey is gravity drained to a sump, is then pumped to a heat exchanger and is course filtered and pumped again to a 14 barrel capacity holding tank. This tank has low level heating coils inside used when air temperatures warrant to eliminate crystallizing.

Barrels of this first-run honey are stored in the back storage room, and gradually replace the supers, as they are emptied, to fill the barrels.

When needed for bottling, barrels are moved from the storage area to the warming room. A homemade barrel lifter is used to move these 650 pound containers. The barrels are placed on top of a draining tank, a half-barrel shaped tank large enough to hold eight barrels of liquid honey.

The cold barrels are placed upside down on a pipe grid on top of the tank, and, when the temperature of the insulated room is increased, the honey gradually liquifies and drains into the tank. During extremely cold weather, the grid, made of a series of pipes, can actually be heated by running hot water through them.

From this tank, the now liquid honey is pumped into another tank in the warm room. Here, diatomaceous earth (Celite™) is added to the honey at the rate of three and a third gallons (by volume) to four barrels of honey. This mixture is slowly agitated to thoroughly mix the two. Because the agitator runs slowly, and is beneath the surface, air is not incorporated.

"We add the 'earth because it attracts other impurities already there", said Ross. "Things like pollen, microscopic dust particles or other material are so small the average consumer would never notice them, but they can form the nucleus of a crystal, and once started the whole jar will go," he said.

From this second tank, the honey is pumped through a stainless flash heater to remove any wax particles and 'set' the honey, then directly through a Shriver filter.

This is probably the Cadillac of filters, and now even more so because Ross beefed it up so honey could be pumped through under pressure. It holds 12, 12" x 12" paper filters that remove the impurities attached to the 'earth added earlier, plus anything else that's there. Honey moves through at the rate of a gallon a minute and goes directly to an unheated bottling tank.

It's after this that the marketing success begins to show though. Both

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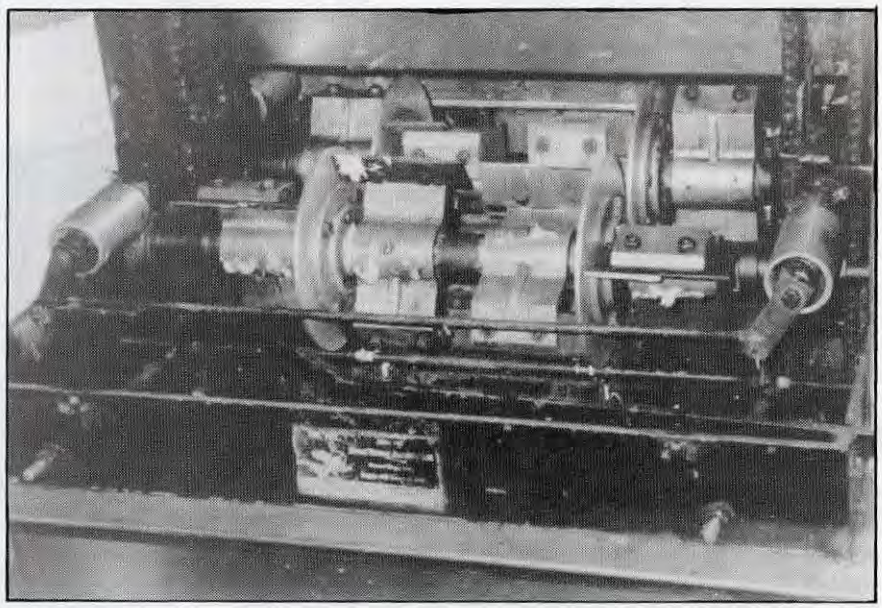


The mouth of the Bogenshutz uncapper. Eight blades, 1,725 RPM and 12 frames/min.

OKLAHOMA . Continued From Page 657

A hand operated pallet and super mover.

Jim and Glenda help with the bottling, and the two of them can make up about a 100 cases (4 barrels) in a six hour stint.

About 50% of the honey they produce and buy is bottled, in bears, one, two and four pound jars. Another 10% goes out wholesale in five gallon pails, and the remaining 40% is sold bulk, unfiltered in barrels.

All harvested honey is put in the buy-back program, and withdrawn almost immediately to be used.

"My marketing priorities are first to grocery stores, under my label, but sold through a broker," says Jim, "then bulk in barrels, and some in gift boxes. If I had to, I suppose I could sell to a packer, and if worse got to worse I'd forfeit it to the government," he adds.

"But the return on retail is so good that that's not likely," he stated.

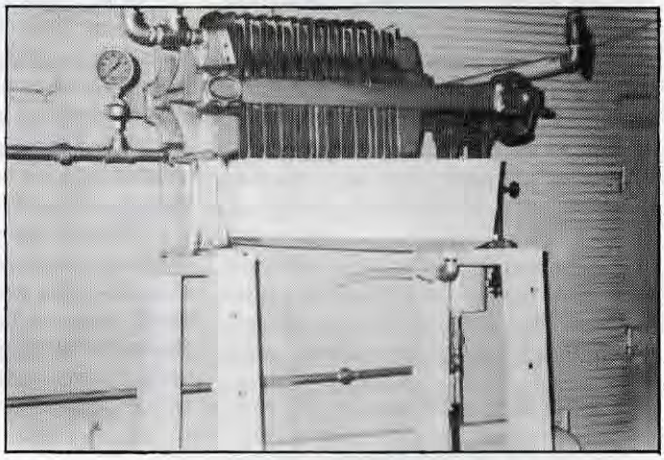
"My broker sells to several large chains in Oklahoma City and Tulsa, and takes 5% for commission. This is a price driven market, though, but even so it's better than delivering to packers," Ross said.

Jim delivers his own honey to the stores the broker has made a sale to, but has run into slotting fees at some warehouses ($1,000/item).

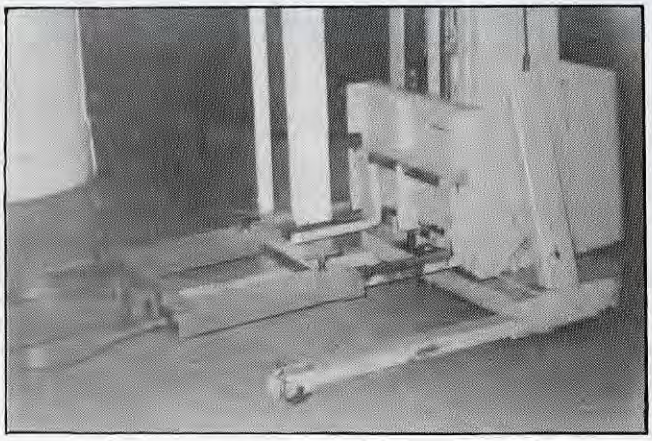
"I don't like it much", he says, "but these warehouses control sales to lots of retail outlets, so they've got you! And, if your product doesn't sell or you pull out, there's no refund," he adds.

"I even ran into a 'trip point' fee one time" he said, where I had to give 15¢ for every case I sold to support the free trips the store managers got as perks for their performance. That hurt, but again, what can you do?"

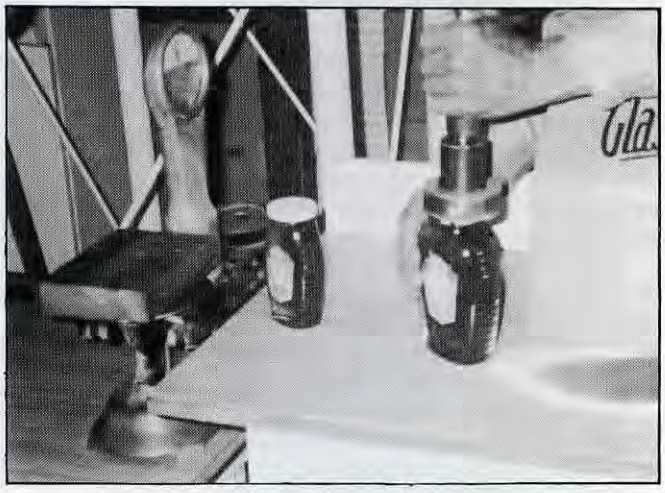
To increase sales, Jim occasionally offers a discount on some products. For instance a $2.00 per case discount will be offered to the warehouse, which is usually passed to the retailer, who then has the additional incentive of a $2.00



The Shriver filter. Each 12" x 12" plate holds a paper filter. The flash heater is directly below this unit.



The homemade barrel lifter.



An automatic lid tightener speeds things up when bottling.

rebate on each case purchased, which Jim pays directly. This comes to a $4.00/case discount.

"Yes, it lowers my margin," says Jim, "but it can move a lot of honey, and generate a lot of cash when it's needed," he added.

Ross Honey's newest venture is making and selling gift boxes.

"We had a box designed that was mailproof and mailready, and was a traveling advertisement," Jim said. "Inside, we put a recipe folder we had printed, a small jar of honey candy, a 12 oz. bear, a one pound plastic jar, honey sticks and a couple of candles (not, however, made of beeswax).

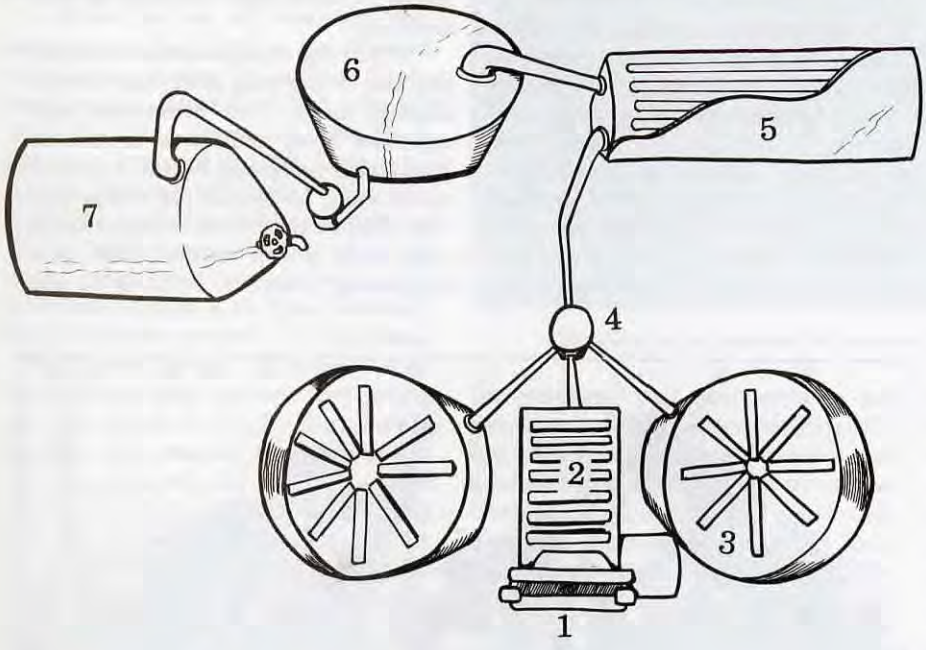
"We've done some local T.V. advertising, and some on the radio, and we're doing a little direct mail — mostly to previous customers. It's been a slow start, but it's growing, and that's good," he said.

Ross Honey Company is a good example of a laterally expanding business. Production, wholesaling, retailing and direct marketing the product, advertising and, once in awhile, dabbling in politics — which should be a natural for Jim Ross.

Besides being the President of the Oklahoma Beekeeper's Association, Glenda is the secretary and editor of the state's newsletter. But Glenda is also the daughter of Glenn Gibson, former owner of Ross's Honey Company, back when it was called Clover Bloom Honey.

Glenn started the company in the early '40's, when he bought out a couple of partners. But now he is, by his own admission, Jim's best, though unpaid, consultant. □

The outside, and inside of the gift box.

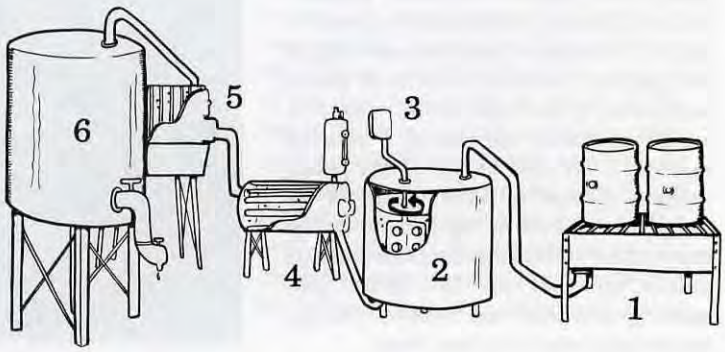


Ross's extraction set-up is simple and efficient. Honey runs from the extractors to a sump, then through a heat exchanger and finally ends up in the holding tank. Wax is separated in a spinner.

1. Bogenshutz Uncapper
2. Frame Holding
3. Simplicity Extractor
4. Sump
5. Hot Water Heat Exchanger
6. Wax Spinner
7. Stainless Holding Tank

The Bottling line starts with crystalized barrels liquefying over a holding tank. From there, the honey goes to the Celite® mixing tank. From there to a heater, a filter and into the bottling tank.

1. Barrel Holder
2. Agitating Tank
3. Agitator
4. Flash Heater
5. Shriver Filter
6. Non Heated Holding Tank



MESQUITE

JAKE LANDERS

On Texas rangeland mesquite is a bit like Athlete's Foot. You can live without treating it for a long time, even a lifetime, but it is aggravating, and it tends to get worse if ignored. Control of a disease once well established is usually more difficult and expensive than prevention, whether it's in your foot or on rangeland. For the most part, mesquite is well established, the time for prevention expired a century or more ago as it spread and densified with the movement of cattle and cowboys.

Several characteristics make mesquite such a successful plant on Texas rangeland. It is adapted to drouth yet it can grow rapidly when water is available. Its leaves are not very palatable to wildlife and livestock, but its ripened seed pods are. Animals consuming mesquite beans seldom crack the small hard seeds which pass through their digestive systems ready to germinate where they are deposited on the ground and simultaneously fertilized. Mesquite trees have a zone of dormant buds beneath the bark just below the ground line. These buds produce vigorous sprouts if the tree is cut or burned. What all this means is that mesquite can get where it's going, can establish without getting eaten up by grazing animals and can survive drought, fire and various attempts by humans to kill it out.

A first year mesquite seedling is pretty weak. A nibble from a sheep or goat and it's gone. Loy Jackson has told me he's killed more mesquite with a garden hoe than a bulldozer because he's cut them off before they get established. I staked a mesquite seedling in the yard so I wouldn't mow it off and it has grown a foot high in four years. It would probably survive if I started mowing it off now. Some in the pecan orchard mowed off every year for 20 years have a root as big around as my thumb and spouts the size of a kitchen match, but they are still alive. Quit mowing and they can make a thorny, waist-high bush in a few years.

To kill a mesquite you need to kill the cluster of dormant buds a few inches below the soil. Mechanical grubbing can do it. Kerosene, diesel fuel or herbicides around the base of the trunk can do it. Foliar application of herbicides which are translocated to the bud zone can do it. Regardless of the method, it's hard to get every dormant bud on every mesquite tree in a pasture in one attempt. Some kind of follow up program of mesquite control is necessary to get the ones you missed and to get the new seedlings from seed laying dormant for years in the soil.

Now that we've got it, what can we do with it? You would be surprised at all the ways mesquite wood has been used. Hardly anyone has missed the use of mesquite wood for cooking. It makes the best barbecue flavoring coals ever discovered. Dad's goat barbecue over mesquite coals satisfied many a gathering of family and friends, and I have his recipe. Mesquite wood also provides heat for hovels and mansions alike in this time of energy rearrangements with the rich looking back to the fireplace for sentimental comfort. Wood, after all, is a renewable resource we'll have after oil. Dry mesquite wood, however, ought to be mixed with something else to slow down the fire. Mother wouldn't burn mesquite in her kitchen store — she preferred live oak. She said dead mesquite burned too hot and green mesquite made too much soot in the chimney. Meltdown of a mesquite-fired stove may never have happened, but over-heated stoves, and creosote-filled flues and chimneys, and such have probably burned down more homes in Texas than kids playing with matches.

Polishing mesquite wood is one of the joys of working with your hands. Objects made from heartwood and sapwood have attractive contrasts. Woodborer holes add to the character of old wood, burls and blemishes provide unique grains and colors, thorns with wood grown around them give interesting patterns. As long as the

brittleness is taken into consideration, mesquite wood is beautiful and workable as any.

Mesquite may be a nuisance under most conditions of ranch operations; however, there are many instances where it is not only tolerated but loved, especially individual trees.

When they moved to the edge of town Jake and Dorrit (friends of mine) fenced in a big, bent mesquite near the house for their dogs which would climb halfway to the top whenever company came. It was hard to tell who enjoyed the visitors the most, Jake or Dorrit or the dogs. Ranch-grown mesquite trees near the edge of cities like Abilene, San Angelo and San Antonio are often retained as part of the new landscaping whether or not dog house shade is needed. Some of the nicest neighborhoods now have mesquite in every yard with a solid grass turf underneath. Mesquite shade is a poor excuse for shade, and lawn grasses do well beneath mesquite with about average attention.

There was an old mesquite that stayed for a long time on the Menard school grounds near the outdoor drinking fountain. Mother said it was big when she started to school there. It was big when I started in 1938. During recess the tree was off limits to climbers, but it survived after-school activities of the big kids who would climb out on one of the main branches, and as it bent with their weight, slide down the small branches to the ground. (You may ask, "What about thorns?" Old trees seldom have them, only sprouts and young trees do. Check it out.) By the time my brother John started they had paved the school ground, and the old mesquite survived that. In 1979 they needed two temporary classrooms to handle the baby boomers, and the old mesquite didn't survive the bulldozer. I hated to see it go. The school grounds are bare without it.

Some mesquite trees exude a gummy sap where they have been injured by borers, wind, ice or pruning saw. They are not nice to park cars under. When I visited the Lee brothers and parked under one of the numerous mesquite trees in front of the ranch house, I noticed a dozen or so 3-pound coffee cans in the trees hung over a limb with bailing wire. I asked, and Bill said it kept the mesquite from dripping on the cars. News to me.

Sometimes the gum hardens into small globs. Roy said the teacher brought it to their country school and they softened the globs in water and used it for glue. I asked Lelia about it and she remembered it too. In Argentina where many kinds of mesquites are grown, gum was collected and sold. Maybe an interest is growing again for mesquite gum to replace gum-arabic once obtainable from Iraq and Iran. If you have some investment money to spare, you might think about cornering the mesquite gum supply in West Texas before it hits Wall Street.

Every Thanksgiving I knock a cluster of mistletoe from a mesquite tree in the backyard and send some to my daughter in Iowa and our daughter-in-law in Montana where mesquite and mistletoe don't grow. It livens up the Christmas decorations. To get real mistletoe in the store they would have to pay 99¢ for two leaves and one berry. I think our daughter distributes her cluster among the in-laws at a fairer price. The folks around Eden knock it down by the pickup load to get some of that 99¢ market. Other kinds of trees grow mistletoe but none around here does it as well or are as easy to get to as mesquite.

Honey from mesquite is good but production is unpredictable. The honey is usually light colored and mild flavored with a tendency for quick crystallization. Mesquite flowers attract a lot of insect attention but hardly get a notice from most people except beekeepers. They bloom off and on all summer. I've seen three crops of flowers in one year many times. A small percentage of the flowers sets beans at any one blooming. Beans were ground or eaten whole by early humans living on the edge of survival, today their use is more of a curiosity. There are recipes for mesquite bean jelly. One from Ruby in Archer City calls for a half-bushel of beans, washed and broken into several pieces, doused with two cups lemon juice and three or four quarts of water and cooked for one hour over low heat. For each five cups of liquid which is poured off, add one box of pectin jellying agent and 7-1/2 cups of sugar. Cook five minutes and pour into jelly containers. Uncle J. D. said when he was growing up near Ft. Worth some neighbors with milk cows would pay 5¢ per bushel for beans. If they had made more mesquite bean jelly instead of feeding beans to their milk cows, maybe mesquite would not have spread so fast.

Mesquite in mid-summer in extreme drought conditions, Coleman County, Texas.

Research scientists are still trying to understand why mesquite has spread so fast across the state and done so well. In recent years they have discovered that mesquite fixes nitrogen from the air as do most other members of the legume family to which it belongs. This may give mesquite a boost on the usually low-nitrogen soils of the original grassland so that once it has established, it has a firm hold on the land. Because mesquite does so well on Texas rangeland, one scientist is trying to make it grow straighter and faster

Continued on Next Page

MESQUITE .. Cont. From 661

for timber production. Who knows, he might find an improved variety to graft onto a West Texas bush to make it a tall, straight mesquite tree. I hope he succeeds because we could grow a lot of telephone line poles of mesquite, and they wouldn't have to be treated with creosote to keep from rotting.

The abundance of mesquite has contributed with other brush species to the abundance of white-tailed deer in the state. Some of the "muy grande" bucks in South Texas have lived in, fed on and hid in mesquite all their lives. Although mesquite may not be a preferred browse species, studies near Uvalde have shown an average of 10% of the annual diet of deer to consist of mesquite leaves and beans. At some times of the year it rises above 50%. Maybe it's good that ranchers have not been able to eradicate mesquite. Income from hunting has made the presence of mesquite, in small amounts at least, almost tolerable.

When you come to think about it, the good Lord must have had our welfare in mind when he invented mesquite: to provide the fuel for heating our homes and cooking our food, beans for food and jelly, feed for our animals, beautiful wood, glue to bind the books of our civilization, some Christmas decorations, some honey to sweeten our tea, and some shade to drink it under. Almost makes me want to go out and plant some. Before I do that, we might first use up what we've got.

Mesquite in flower and fruit.

Los Amigos del Mesquite is an organization that has taken on the challenge of advertising the finer qualities of mesquite. You can become a full member for $16 a year and receive the Mesquite Messenger usually full of all kinds of information on mesquite (P.O. Box 15551 Northeast Station, Austin, TX 78761. It has been organized since 1980 because of "a mutual fascination and/or professional involvement with at least one aspect of mesquite among its members". □

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HONEY CANDY

DIANA SAMMATARO

Start a Seasonal Tradition This Year — Feature Honey Candy for Family & Friends

During the holiday season, gifts of food to neighbors, friends and relatives are often exchanged. For the beekeeper, honey and wax candles or ornaments are the usual offerings, but many people find honey "too sweet" for their tastes, or don't want to deal with its stickiness.

While cookies and cakes can be made with honey, so can candies and confections. Why not add some of these to your list of "honey things" to make. Some are quite simple, requiring no cooking. Others are more complex, but elegant. Both liquid and crystallized honey can be used, and even comb honey!

The major problem with honey candy is the high temperatures needed to cook some of the recipes. The proteins and other materials in honey can burn, giving the end product an off or burnt taste. This is especially true if the honey is not fine filtered, contains much foreign matter or is heated over 260°F.

Also, the 18-20% moisture content in honey can cause trouble, especially if "hard" candy is made. This latter can be avoided if soft candies are dipped in a chocolate coating to seal in the honey. The other solution is to eat it quickly!

While looking through various honey cookbooks I found several recipes which looked interesting. The first used un-cooked honey in various forms, while the latter are a bit more sophisticated.

Here is a no-cook method of using up otherwise unsaleable comb honey. Serve it up on a toothpick:

■ Honey Bittersweets

Comb honey
hot water
confectioners' chocolate

Let comb honey remain in refrigerator or freezer 24 hours before using. Cut comb honey into pieces about 3/4 inch long and 3/8 inch wide with knife that is dipped in boiling water. Place pieces on trays covered with waxed paper; chill 30 minutes. Coat with dipping chocolate. Drop a nut on each piece. (It requires a little practice to be able to turn out honeyed bittersweets that do not develop honey leaks.) It is necessary to have dipping chocolate at proper temperature (about 70° to 75°F) when coating. Coating in a room of 60° to 65°F will cause the chocolate to harden more quickly.

Old Favorite Honey Recipes
Honey Institute

WENNER HONEY FARMS, INC.
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Glenn, CA 95943
(916) 934-4944

■ Honey Balls

1-1/2 cups powdered milk
1 cup honey
1 cup peanut butter
1 can coconut
1 cup Wheaties

Mix powdered milk, honey, and peanut butter in a pan. Stir until ingredients are thoroughly mixed. Roll out in long rolls. Spread coconut and Wheaties together on waxed paper. Roll the long rolls in the mixture. Cut in balls and chill.

Drops of Gold — Ohio Honey
Ohio Dept. of Agriculture
Gleanings in Bee Culture, April 1975

Here is an easy and simple chocolatey mixture that makes my mouth water!

■ Chocolate Honey Fudge

2 cups sugar
1 square unsweetened chocolate
1/4 tsp. salt
1 cup evaporated milk
1/4 cup honey
2 Tbls. butter
1 cup nuts (optional)

Boil sugar, chocolate, salt and milk for five minutes. Add honey and boil to soft ball stage (240°). Add butter and let

Continued on Next Page

stand until lukewarm. Beat until creamy. Add nuts. Pour into buttered pan. Cut when firm.

Mrs. Walter T. Kelley

Honey and dried fruit are an excellent combination. Try some of these easy recipes:

■ Fruit Candy

1/4 cup dried prunes
1/4 cup dried apricots
1/4 cup dried figs
1/4 cup raisins
1/2 cup dates
1/3 cup honey

Let dried prunes and apricots stand in boiling water 5 minutes. Run all the fruit through a food chopper using fine blade. Add honey. Butter the hands and shape into balls. Roll in chopped nuts, coconut, or coat with confectioners chocolate.

Gleanings in Bee Culture, April, 1975

Here's one that requires some cooking.

■ Honey Chews

Cook 1/2 cup of butter and 1 cup of honey over slow heat for about 50 minutes, or until the mixture reaches 260°F. (130°C.). Stir frequently. Remove from heat. Add 1/2 cup of chopped dates and 1 cup of chopped walnut. Pour into well-greased pan. Let cool. Cut into squares. Wrap in wax paper.

How To Use Honey
Circular #528 USDA

Honey and citrus are a good combination too. Try these:

■ Honey Orange Strips

Remove the peel from 3 oranges in quarter sections, then cut the peel into strips with scissors. Cover the rind with salt water in the proportion of 1 Tbls. of salt to 1 quart of water and let stand overnight. Drain and cover with cold water, then bring to the boiling point; repeat this process three times. Then if tender, rinse in cold water, drain, then simmer very slowly in 1 cup of honey from 45 to 60 minutes. Remove the rind with a fork, drain and lay on waxed paper. Allow to dry for a day or two.

Grapefruit may be prepared in a similar way but grate rind carefully before cooking tender in an abundance of water. Drain, then cook the peel in a syrup made with 2 cupfuls of honey, 2 Tbls. lemon juice or grapefruit juice.

Cook the grapefruit strips one hour or more, then allow them to stand all night in the honey syrup. Remove with a fork and lay on waxed paper for a day or two.

Honey In Florida
Department of Agriculture

■ Chocolate-Coated Orange Peel With Honey

4 large oranges
1/2 tsp. salt
2 cups vinegar
1 cup water
1 pkg. (8 squares) semi-sweet chocolate
1/4 cup light, low water content honey

Wash oranges and remove peel in quarters. Place peel in saucepan. Add salt and cover with water. Bring quickly to a boil; then simmer 30 minutes. Drain. Again cover peel with water, bring to a boil, and simmer until peel is tender about 15 minutes. Drain and cool. Scrape white inner skin from peel. Cut peel in 1/4" strips.

Combine 2 cups sugar, 1 cup water and honey in saucepan. Cook and stir until sugar is dissolved. Add orange peel. Cook until small amount of mixture will form a very soft ball in cold water (230°F.). Drain peel and roll in additional sugar. Let stand overnight on a large platter or tray. (If peel is to be stored before dipping in chocolate, place in a lightly covered container.)

Partly melt chocolate over hot water. Remove from water; stir rapidly until entirely melted. Let chocolate stand until it feels cool to the touch (83°F). Quickly dip strips of orange peel in chocolate. Place on wax paper until chocolate is firm.

Makes about 1 pound.

Drops of Gold
Ohio Honey

Honey and nutmeats, like walnuts, or pecans, are a natural pair. Here are some more involved recipes, that will test your skill. At least if it doesn't turn out looking pretty, you can still eat it. Use light and finely strained honey for these recipes.

■ Honey Divinity

2 cups sugar
1/3 cup honey
1/3 cup water
2 egg whites
1/2 cup chopped nut meats

Boil sugar, honey, and water until syrup spins a thread (278°F). Pour syrup over well-beaten egg whites, beating continuously. Just before mixture starts to set, add chopped nut meats. When mixture crystallizes, drop with a spoon on waxed paper.

Variation: Candied cherries or candied rhubarb may be added.

Old Time Favorite Honey Recipes

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■ Honey Nougat

1 cup sugar
1/2 cup honey
1/2 cup water
2 egg whites, stiffly beaten
1/4 tsp salt
3/4 cup chopped almonds
1/2 cup pistachio nuts
1/4 cup candied cherries
1 tsp. vanilla extract

Mix sugar, honey, and water in top of double boiler. Cook slowly, stirring only until sugar is dissolved. Then cook until brittle when tested in cold water (300°F). Pour syrup over the stiffly beaten egg whites, beating constantly. Fold in salt, nuts, cherries, and vanilla. Return mixture to double boiler and cook, stirring constantly until it will hold its shape when dropped from a spoon. It should not be sticky to touch. Pour into a greased pan. Let stand a day before cutting. Cut and wrap in waxed paper.

Tempting Honey Recipes
Sue Bee, Sioux City, IA

■ Honey Chocolate Centers

First Part: Coating
6 squares semi-sweet chocolate
1 Tbls. cream cheese
1/2 cup powdered low fat milk
2 Tbls. honey

1. Melt chocolate over hot water and cool to 120° to 130°F.
2. Mix cream cheese, salt, honey and powdered milk until smooth.
3. Add chocolate to above mixture and mix thoroughly.

Second Part: Filling
2 Tbls. 150 Bloom or Knox gelatin
1 Tbls. cold water
1/4 cup cold light honey
1/8 tsp. salt

1. Soften gelatin in cold water.
2. Heat honey and salt to 150°F.
3. Pour the hot honey into soft gelatin and beat with electric beater for about 15 minutes.
4. Mix the first and second parts immediately.
5. Put into a buttered decorating bag and fill flexible buttered or oiled molds such as caramel square or kiss mold.
6. Unmold and dip into chocolate coating above or carob coating.

■ Turkish Delight

3 Tbls. gelatin (3 pkgs.)
1/2 cup cold water
2 cups honey
1 orange, grated rind and juice
1 lemon, grated rind and juice
red or green food coloring
icing sugar or arrowroot flour

Soften gelatin in cold water. Heat honey to boiling. Add gelatin, gently boil for 20 minutes. Add juices, rind and coloring. Pour into greased 9 x 12" pan so mixture is 1/2 1" deep. Chill until firm, about 24 hours. Turn out on board, dusted with icing sugar or arrowroot flour. Cut into cubes or other shapes, roll in sugar or flour. These are sticky, use a lot of icing sugar. Store in refrigerator. Makes 4 dozen pieces.

A Honey of a Cookbook Vol. II
Alberta Beekeepers Association

■ Honey Fondant

2/3 cup honey
4 cups sugar
2 cups boiling water

Cook honey, sugar, and water slowly. Do not let boil until sugar is dissolved. Keep crystals off side of the pan with cloth wet in cold water and wrapped around a fork. When sugar is dissolved, bring to a boil and boil slowly to the soft-ball stage (238°F.). Keeping a cover on the pan part of the time helps to keep the crystals from forming. Remove from fire and pour at once on large buttered platters. When lukewarm stir until creamy. Knead until smooth. Fondant improves if allowed to stand a few days before using. Flavor as desired.

Old Fashioned Honey Recipes

■ Honey Marshmallow

1 tsp. 225 Bloom gelatin
1 Tbls. hot water
1/4 cup honey
1/4 cup mint flavoring

1. Soften the gelatin in hot water.
2. Heat honey to 150°F.
3. Pour the gelatin mixture into the hot honey pan and stir until the gelatin is dissolved.
4. Beat with an electric or rotary beater for 5 minutes.
5. Put into buttered decorating bag and fill oiled candy bar mold.
6. The marshmallow may also be used to fill chocolate coated bon-bon cups.

H. Gutzman

■ White Licorice Taffy Chews

1 cup honey
1 Tbls. Butter
12 drops of oil of anise

Cook honey to hard ball stage — 250°F. Add 1 Tbls. butter and oil of anise. Pour out on buttered platter. Cool and pull on taffy hook. Cut and wrap in twisting wrap.

H. Gutzman

■ Honey Butter Brittle

1 cup coarsely chopped toasted walnuts
1 cup butter
1/2 cup brown sugar, firmly packed
1/2 cup honey
dash of salt
1 tsp. vanilla

Spread walnuts on cookie sheet and toast at 350° for 15 to 20 minutes. Combine butter, brown sugar, honey and salt in a saucepan; bring to a boil, stirring, then add 1/2 cup chopped walnuts. Continue, stirring frequently to hard crack stage (300°F); add vanilla. Pour candy onto well buttered 8" pan. Cover top with balance of toasted walnuts. Press nuts down into candy. When candy is cold turn out of pan; break into small irregular pieces.

Drops of Gold
Ohio Honey

For candy molds and equipment, contact Root's West Liberty Commons, 623 W. Liberty, Medina, OH 44256, (216) 723-4359.

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INNER COVER . . . Cont. from Pg. 620

for the money. If fact, the amount of surplus honey they produce is directly proportional to their lack of enthusiasm for the craft.

Once enough honey is gathered to feed family, friends and a few at work — the rest is simply a burden. I mean, what can you do with the stuff, really?

Well, for the moment, I'm not going to worry about how much you harvest. Rather, what I'd like to look at is how to produce, or not produce, however much you harvest more efficiently.

If you're intent on making honey, or making money making honey, then you are also intent on the efficiency of

the process, the cost of production and the profits made from sales. On the other hand, if making honey, and (heaven forbid) making profits is not important, think about this —

If I can show you how to enjoy your bees as much, or more, than you do now and produce as much honey as you want (plus maybe just a bit more), and still put ten bucks in your pocket that you wouldn't have had — would you do it? Would you do it for $20.00? Or $50.00? Remember, nothing changes no more colonies, no selling honey to anybody that breathes, nothing changes except you have extra money, to spend on a night out with the family, or a well deserved fishing trip.

Now if you're in it for the bucks, full time for a living or part time as added income, that $10.00, or $20.00 or $50.00 is important, not for a night out or a fishing trip (but don't forget these) but the next payment to the bank, or the next load of glass, or paychecks or

This isn't going to be about better beekeeping though, but rather, doing better business. It doesn't make any difference whether you make widgets, magazines or honey, there are some business practices that apply to all businesses. And, that's what we're going to explore here — good business.

What I want to do is take a look at business from several angles. And whether you're a one man operation, or a 15 person show, the principles of management, efficient production and astute financial dealings will pay dividends — read that as cash.

By management I'm referring to looking at the big picture, and seeing how all the pieces fit together whether it's all the people, or all the equipment or all 12 months. So with that in mind, consider these improve-the-bottom-line factors —

- Reduce hourly wages during slow months, without losing key people by giving some unpaid time off; a day a month, or a half day a week, or start an hour later each day.
- Find at least one alternate supplier for every supply you need. This gives a better picture of their industry, and a place to go in an emergency.
- Subcontract work. Either hire out your facilities or people to take up slack time; or find somebody to do yours for a price that's lower than it costs you to do it.
- Double check every insurance policy. Make sure you have everything covered, but not overcovered, and that you're not paying for that shed you tore down two years ago. Then, check with other agencies for more coverage, or better coverage or reduced premiums.
- Watch the simple things — like utilities. Are lights left on, water running, hot water heaters too hot, AC or heat used unnecessarily?
- Can you refinance an older loan with a lower cost loan now? Or, can several loans be consolidated to improve cost and cash flow?
- Establish a minimum order amount to cut down on high-cost, small orders. Or, make sure your small order prices reflect the increased cost it takes to fill and deliver them.
- Reduce travel, especially sales calls, if possible. Use the phone instead.
- Evaluate your sales broker's activities and success. Scout the area for an alternate — just in case.
- Audit your mailing list, if you do mass mailings. Postage increases in 1991 will be dramatic, and cutting the deadwood from your list will mean big savings.
- Evaluate all advertising and promotional costs and responses. Spend more where they work, less (or none) where they don't. Investigate advertising costs, too. Would black and white do as well as color? Would a three month contract work as well as a four? Would a small size work as well? Is any business coming from the yellow pages?

I guess that's enough business this month. There hasn't been anything earth shattering here, just common sense, and a bit of logic. Next time, we'll take a look at production costs. This will certainly be more beekeeping oriented, and more fun!

KIM FLOTTUM

BEE TALK

RICHARD TAYLOR

Box 352, Interlaken, NY 14847

"Investigate this income alternative."

Can you make a good living at beekeeping? This is a question that is apt to occupy the thoughts of beginning beekeepers, once they have gotten into the craft and had some success at it. They have perhaps ten colonies, and make maybe five hundred to a thousand dollars in one season selling honey, then do a little figuring of what it might mean if they built up to five hundred or a thousand colonies, and, on paper, it looks pretty good.

That, I think, is not the right approach. Honey production on a large scale involves an enormous amount of work, huge overhead costs, many headaches, and it may not be, I think, a good road to economic security — at least for most. Moreover, much of the fascination of beekeeping is lost. Your time and toil are expended just moving huge quantities of honey.

There is, however, another approach, and I'm going to get at this somewhat indirectly, by describing how some neighbors of mine found a fulfilling and secure life raising pigs.

These people lived in New York City, but yearned for the country life. So they moved up to these parts and started a pig farm. But they didn't prosper. Costs, especially land costs, worked against them. In time, however, they discovered that there was an interest in what they were doing. Teachers would ask whether they could bring their school children out to visit the farm. Senior citizen groups would from time to time make the same request. This was somewhat time-consuming, so my neighbors started charging a reasonable fee for such visits. And this soon gave their undertaking an entirely new direction. Some large and attractive signs went up along the nearby highways, directing people to the Misty Meadow Hog Farm. Tours became popular, and in time these resourceful people were conducting, during the summer, five scheduled tours a day. Tourists began appearing in large numbers, as well as the usual groups of school children, senior citizens and so on, and they get their money's worth. They see a family farm in full operation. The proprietor offers interesting and informative commentary on farming in general, and pig farming especially, with many facts and figures of general interest. Children all get to hold a baby pig. Visitors all pass through a gift shop, where all sorts of things, with porcine theme, are offered — T-shirts, mugs, souvenirs, and so on. And there is a lunch room, where country food is offered, buffet style, along with the pork sandwiches, sausages and so on, produced there on the farm. By now, after these several years, this farm has become a famous institution, the source of much enjoyment to its many visitors, and highly profitable, I believe, to its owners.

"Someone with enthusiasm, and a friendly manner, could make a very good life doing this."

Now why couldn't someone do that with bees? Bees are vastly more interesting to everyone than pigs. And there is a certain mystique to being a beekeeper. I see this when I meet people at my honey stand. They, upon learning that I am a bona fide, living beekeeper sometimes regard me with a certain awe. Imagine the interest one could generate with a talk about bees and their ways. Think what an array of things a gift shop oriented to beekeeping could contain in the way of honey, beeswax, candles, gift packs of the various kinds of honey, honey candies, pins, honey plants — the possibilities seem endless. Visitors could see a working honey house, observation hives, and actual bee hives. I am sometimes astonished at the numbers of people visiting my honey stand who want to see, if only from a distance, an actual apiary. And what could be more obvious than a lunch room, or tea shop, based upon honey? There could even be a separate, and hugely profitable, baked goods department.

Something like this could provide an unforgettable experience for visitors and tour groups. Of course this idea is not new. Such honey farms, open to visitors, have long existed, and those I am familiar with have seemed to me highly successful. But I bring it up here, as something some young and industrious beekeepers might want to consider. Someone with enthusiasm and a friendly manner, someone who likes dealing with people and who loves beekeeping, could make a very good life for an entire family with this kind of approach. A beekeeper, in love with his craft, could enjoy it to the fullest and, in addition, share those joys with others, endlessly. It is certainly something I would want to consider, if I were younger.□

QUESTIONS?

Late Honey

Q. My bees are getting a lot of fall honey, and my experience has been that this late honey granulates in the combs and cannot be extracted after that, but on the other hand I want the bees to have plenty for winter. Should I harvest this late honey?

Trudy Florence
Leakey, TX

A. There is certainly no harm in leaving all the autumn honey for the bees. What they do not use for winter food they will use to build up on in the spring, and if it is granulated, they have ways of dissolving it. On the other hand, so long as you leave plenty of it for the bees, there is no reason why you should not extract some of that fall crop before it granulates in the combs. Most beekeepers do this.

Frozen

Q. How come if you put honey in the freezer it does not crystallize, but if you refrigerate, it does?

Mrs. J. B. Barrett
Gaston, IN

A. Honeys that granulate usually do so most readily at about 57°F, and usually granulate much more slowly, or not at all, at temperatures much below that. Honey usually remains liquid indefinitely at 0°F.

What Happened?

Q. In October I had seven healthy, strong double-story colonies going into winter, with the top stories heavy with honey and pollen. By February three were dead with no stores, two were dead with plenty of stores but almost no bees, and the other two were fine. What happened?

Wayne Emerick
Hyndman, PA

A. Tracheal mites. You can revive all five colonies by taking fifteen combs of brood and bees from the two good colonies, giving three to each dead one (in exchange for empty combs), and requeening.

Let's Mead

Q. Where can you get supplies for making mead?

R. R.
Middlesboro, KY

A. The equipment and yeasts, etc., for mead making are the same as for wine making generally, and wine makers equipment can be found in the yellow pages for almost any fair-size city.

Used Disaster

Q. I picked up American foul brood in several colonies from some used supers I bought. Now what do I do? Can the equipment be boiled in dilute clorox or lye? Should it be burned?

James Midkiff
Mt. Airy, NC

A. The best, and I think the only, way to deal with a colony that has confirmed American foul brood, is as follows. First, dig a pit near the apiary. Next, kill the bees, using a spray can. Try to get a spray can containing Resmethryn, but if you cannot find that, use another that assures quick effectiveness. Open the hive and spray between the combs. Do not worry if some of the flying bees escape execution. Next, pile all combs into the pit, add a bit of kerosene, and burn them. When consumed, cover the pit over with dirt. The rest of the equipment can be saved, as follows. Stack the empty supers and hive bodies on a bottom board. Sprinkle kerosene inside, aiming especially at the corners. throw in several sheets of crumpled newspaper, followed by a lighted match. The stack now becomes a roaring chimney. When you think the inside is nicely singed, which doesn't take long, smother the fire by covering the stack and covering the bottom board entrance. Do not neglect to scorch the inner cover. This whole procedure can be accomplished fairly quickly, several colonies can be dealt with at once, and your hives will be free of disease and ready to use again.

Hybrid Hyjinx?

Q. I have heard that it is not wise to use hybrid queens because if they are superseded the resulting brood may have undesirable traits such as aggressiveness or propensity to swarm obtained from inherited recessive genes. Is this true? And do hybrids supersede more frequently?

R. Swartz
Hopewell Jct., NY

A. I think these are not good reasons for not using hybrids. It is true that a hybrid queen will eventually be superseded, one way or another, and her desirable traits will be diluted or lost, but I do not believe a hybrid queen is more likely to get superseded than a non-hybrid. Quite apart from genetic theory, the fact is that experienced beekeepers who use specially bred queens uniformly report good results.

(Questions are welcomed. Address Dr. Richard Taylor, Box 352, Interlaken, NY 14847, and enclose stamped envelope for a prompt response.)

ANSWERS!

Richard Taylor

GLEANINGS GLOBE

NOVEMBER, 1990 ALL THE NEWS THAT FITS

An Early January Winner

HONEY PRODUCERS IN BATON ROUGE

The 22nd annual convention of the American Honey Producers Association will be held in Baton Rouge, LA, January 8-13, 1991, at the Holiday Inn Holidome South. Included in the program this year will be discussions on the new farm bill, the honey loan program, the National Honey Board referendum, new research reports featuring speakers from across the country, and the work currently being done at the Baton Rouge Bee Lab. Also included in this year's program will be a departure from the norm; Lt. Jim Bullard, Memphis, TN., will be presenting a program called "Self Defense for Women", a very informative and entertaining program that will be enjoyed by all, men and women alike.

The program outline is as follows:

• **Tuesday Jan. 8**: Executive committee meeting; 1990 Board of Directors meeting; Convention committee meetings and an evening reception.

• **Wednesday, Jan. 9:** Registration and Exhibits open, and General sessions until 5:30 p.m.

• **Thursday, Jan. 10:** General session until noon, then a visit to the Bee Lab.

• **Friday, Jan. 11:** Breakfast, courtesy of Holiday Inn; General sessions until 3:00 p.m., then a Bayou boat ride and Cajun Dinner.

• **Saturday, Jan. 12:** General sessions until noon; Business meeting and Board of Directors meeting. Annual Banquet and Awards Ceremony that evening.

• **Sunday, Jan. 13:** Executive Committee meeting; Beekeeping School, all day.

Room rates at the Holiday Inn Holidome will be $48.00 plus tax, and this includes a full buffet breakfast for two each day. It is important to call or write the Holiday Inn to make your reservations before December 15, 1990. For reservations, call the Holiday Inn South at (504) 924-7021.

American Airlines is the official carrier for the Convention. For an additional 5% off of the lowest airfares, call 1-800-433-1790, and ask for STAR File #S-0111PI.

For additional information, contact AHPA Secretary-Treasurer Ray Chancey at 409-258-3034, or write AHPA Convention, P>O> Box 815, Dayton, TX.

INSIDE GLOBE

Workshops Highlight Attraction

FEDERATION MEETS IN MOBILE

The American Beekeeping Federation's 1991 convention will again include the simultaneous workshops which were found to be so popular at the two previous conventions. The convention will be Jan. 23-27 at the Stouffer Riverview Plaza Hotel in Mobile, Ala.

"You might say the workshops are back by popular demand," says Troy Fore, ABF Secretary and Convention Chairman. "We first tried them in Indianapolis; they went over so well that we expanded them last year in Las Vegas. The small sessions allow the audiences to participate more and allow the presenters to tailer the sessions more toward the true interest of the audience.

The day-by-day schedule shows:

• **Wednesday, Jan. 23:** ABF Directors meet in the morning. The General Session opens at 1:30 p.m. The Honey Queen Reception is set in the evening.

• **Thursday, Jan. 24:** The General Session runs all day. The Ladies Auxiliary will meet in the morning, and over lunch. A local outing is being planned for Thursday evening, to give the beekeepers from across the country a feel for Mobile and the Gulf.

• **Friday, Jan. 25:** The General Session will continue in the morning. Workshops are scheduled for the afternoon. The evening is free.

• **Saturday, Jan. 26:** Workshops continue in the morning. The annual ABF business meeting will begin with preliminary reports before lunch and continue in the afternoon. This change from the traditional schedule is designed to allow more time to conduct the Federation business without having to rush it to completion. The Annual Banquet and Coronation Ball will conclude the evening.

• **Sunday, Jan 27:** The ABF Directors will meet early enough to conclude before church services. After lunch, the Riverview Plaza is staging a Super Bowl Party; everyone is invited to watch the game on wide-screen televisions.

The convention is scheduled to allow most attendees to take advantage of reduced over-the-weekend air fares. Travel arrangements are being handled by Caravell Travel management; call toll-free 800-222-6664. Fares 5% lower than published fares are available on the three convention airlines: Delta, American and Northwest. Caravell can book any airline with the lowest available fare. For persons who might want to mix in some additional travel destinations, Northwest will honor the convention fares for service to and from Biloxi/Gulfport and New Orleans as well as Mobile.

Information on sights and attractions in Mobile are available from the Mobile Convention and Visitors Corp.; call tool-free 800-666-6282.

Hotel reservations may be made at Stouffer Riverview Plaza, 64 Water St., Mobile, AL 36602, ph. 205-438-4000, extension 265.

For information on the convention in general, contact the American Beekeeping Federation, P. O. Box 1038, Jesup, GA 31545, ph. 912-427-8447.

Advice You Can Use Today!

PRACTICAL RESEARCH

In early October, researchers from the U.S., Canada and Mexico met in Tucson for the American Bee Research Conference. Although the entire projects are reported elsewhere, below are summaries of papers immediately useful to beekeepers.

Looking For A Feral Colony? Adrian Wenner, studying feral colony removal from Santa Cruz island, cited an old formula: Set up a feeding station, mark bees feeding and track the time required for the marked bee to return. Multiply the round trip time by 150, subtract 500, and you have the distance to the colony in meters. To get a better idea, move 100 yards 90° from the observed flight path, repeat, and triangulate.

Pollination Promoter. Steve Buchman documented several areas on honey bees that pollen hides in. Honey bees can't reach the areas between their front legs, directly on top of their head and on some spots of their abdomen. Some plants benefit from this, so pollen isn't removed, and the plants are pollinated.

Bait Hives. What makes bait hives work? Justin Schmidt says that after the basics, like correct cavity size, being 5-15M off the ground and in the shade, using the pheromone lures is most important, followed by using a preinhabited container, and finally adding a section of old brood comb.

Catching Swarms. If you are trying to catch swarms your apiary throws, put bait hives between 250 and 500M from your hives. Research shows twice as many swarms land this distance from their original hives than either closer or further.

Killing Honey Bees. With the increased attention on honey bees by the public, beekeepers will need fast, safe means to remove unwanted honey bees. Texas scientists found that a new insecticide (not yet available) called ETOH worked best on free hanging swarms, but cold soapy water was almost as good (98% vs. 97%) in 30 minutes. For bees in walls, Resmithium was best, followed by either Yard Guard or ETOH. For bees in hives Potassium Nitrate (KNO_3) in a smoker (2-4 Tbls./smoker) was effective but dangerous, followed by pyrethrins insecticide, followed by placing the hive in a plastic bag for about an hour. Beekeepers need several alternatives to deal with troublesome bees.

Do feral hives harbor diseases? Apparently not, according to Dr. Martha Gillium, USDA ARS Tucson. In a study of feral colonies in AZ, bees were as healthy or healthier than managed colonies nearby. In fact, managed colonies tend to contaminate feral colonies. Wax moths do not clean up feral colonies, according to Gilliam. In fact, they don't eat AFB scales, leaving residue spores in the cavity. Where do they go?

Tough Bees. Ants are prevalent in the tropics. When ants attract European colonies, it takes 75 seconds for a responce; with African bees, 12. European bees attack with only 17 bees; Africans 49. No wonder they're here to stay.

Don't like the Color of Your Bees? It's a well known fact that as an insect's range moves to colder climates, progeny become larger and darker. Marla Spivak has shown that when raising yellow queens and black queens, if the temperature the pupae is exposed to is increased the color of both lightens. And, if the temperature is lowered, the queens become darker. If checking color changes, Spivak says to look at the legs first. Variability in the abdomen stripes make that cue impossible.

Another Use For Canola? Canadian researchers, after hearing that shortening and sugar patties were not controlling mites, decided to try canola oil and sugar. Using a 1:3.5 oil:sugar formula, they fed in late June, and by late August had reduced infestations in treated colonies to 15%, while untreated colonies were at nearly 30%. 250g patties lasted 4-7 weeks.

Menthol, again. Canadian researchers treated infested colonies with menthol before the honey flow. Untreated colonies ended up with 55% infestation at the beginning of the flow, and did not survive the winter. Treated went down to about 2%, made a crop, and survived the winter.

USDA CUTS STAFF

The USDA Honey Bee Laboratory was forced to reduce staff because of recent budget cuts. One staff scientist, Dr. Gordon Waller, and a technician were terminated effective October 1, 1990. Operating budgets for the current fiscal year required staff reductions, and if Gramm-Rudman cuts take effect, more reductions will be required, from either the Tucson Lab, or one or more of the remaining labs.

CANADIAN INSPECTOR KILLED

A Canadian federal Department of Agriculture beekeeper was recently trampled to death by a bull.

Ontario Provincial Police said Walter Hughes, 66, was destroying old hives in a farmer's field near Sudbuy, Ontario, when he was attacked by the bull. OPP said there were no witnesses to the incident so they don't know what provoked the animal.

MEDIA EXPOSURE HARMS CHEMICAL USE

Federal Gov't. Calls For Changes

USDA, EPA, FDA ALL INVOLVED

Regulations of chemicals through media events and incomplete information will have adverse short run and long run effects on producers and consumers. So writes USDA Deputy Secretary, Jack Parnell in the current issue of *Choices*, The Magazine of Food, Farm and Resource Issues. He focuses on the concerns in our society over the use of chemicals in the production of food and fiber.

Mr. Parnell emphasizes the importance of chemicals to the productivity of U. S. agriculture and argues for continued support of research focused on "new technologies that maintain agriculture's competitiveness and efficiency while being more environmentally sensitive."

In recognizing that media events have impacted the regulatory process, USDA Deputy Secretary Parnell argues that, "Science and a scientifically based process give us a sense of proportion that headlines do not provide. Science can tell us if there is a problem, and if so, how significant the risk is."

Mr. Parnell, suggests that changes are required in the way chemicals are regulated and that, "We in the Federal government have a great deal of work ahead of us." In doing so, however, he stresses that, "We must not panic ourselves into a massive overreaction against pesticides."

The Deputy Secretary also calls for three types of changes in the regulatory process base decisions on more complete information (collect more and better data with USDA, EPA and FDA developing jointly approved protocols), make more timely decisions including a streamlining of cancellation procedures, and utilize current science throughout the regulatory process.

Designed to fill a niche in American Research!

BEE SCIENCE DEBUTS

CHESHIRE, CT — A new scientific journal dealing with bees and beekeeping has been published. Called *Bee Science*, the quarterly peer-reviewed journal includes scientific articles of original research and news and information of a scientific nature concerning bees. It is the first "all-bee" scientific journal published in the North America. Edited and published by Dr. Lawrence Connor, owner of Wicwas Press, the publishing division of Beekeeping Education Service. "The decision to introduce a new journal dedicated to the publication of original bee research was based upon careful analysis of several factors which influence the people who conduct this research," Connor noted in the first issue. "There is an apparent increase in the number of research papers which are published about bees and pollination. This reflects both the fascination many scientists have with bees and pollination as well as the increased pressure to conduct research on critical problem areas. In addition, scientists from other disciplines have traditionally used bees as research subjects because of the unique features these insects possess," he noted.

Connor explained that research papers currently appear in a wide range of scientific publications spread over the world. This frustrates both the researcher and the beekeeper. "Since there is no 'bees-only' research journal published in the United States or Canada, the addition of *Bee Science* should help both authors and readers find the latest information," Connor said. *Bee Science* is, however, an international publication with non-U.S. contributors.

Bee Science is intended for bee scientists, scientists from other areas, as well as interested officials who deal with bees and beekeeping. But *Bee Science* will contain articles which are designed to be understood by other readers, such as beekeepers, who are not necessarily scientifically trained. Special features will appear in a series titled **Understanding Bee Science** to help bridge the information gap. Such an article appears in the first issue by Dr. Roy-Keith Smith of Georgia. His article discusses hydrocarbon testing in honey bees, and is designed to help the non-scientist understand his scientific paper on identification of African bees by using hydrocarbon analysis.

The first issue also contained sections called **News & Events, Awards**, and **Letters & Releases**. Future issues will include sections entitled **Reports, Literature Reviews, Book Reviews, Forum** and **Opinion**. Other areas will be added as needs dictate.

Scientific journal costs have increased dramatically over the years, and frequently exceed $100 per year. *Bee Science* has been priced (at four 4 issues per year) at a price equivalent to the cost of a good hardcover novel $20 for volume one. This price is for pre-paid subscriptions. Additional charges include $5.00 for invoicing, $5.00 for surface-mail subscriptions outside the United States, or $15 for airmail subscriptions outside the United States. British subscribers may pay by U.K. cheque at £15 for surface mail or £25 for airmail. Payment may be made by check, money order, or Visa/Mastercard(or their overseas equivalent).

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Pie Charts on Pies?

NEW LABEL LAWS & YOU

Those small-print listings of nutritional information on food labels don't always give consumers the information they want. That may change soon, says Sharron Coplin, nutritionist at Ohio State University.

"When rules on nutrition labeling first went into effect, there was more concern about nutritional deficiencies, not nutritional excesses," Coplin says. Now people are more concerned about consuming too much fat, cholesterol, sodium and calories than they are about getting enough vitamins and minerals, she says.

That's one reason the Food and Drug Administration is considering changing the rules about nutritional information on food labels, Coplin says. New regulations could be in place within a year.

Among the proposals the FDA is considering are:

• Make nutrition labeling mandatory on all packaged foods, except for herbs, spices and foods made by small businesses. Information should include calories from fat, saturated fat, cholesterol and fiber. Thiamin, riboflavin and niacin would be optional.

• Use pie charts or bar graphs instead of a list to make nutritional information easier to read.

• Define terms such as "lite" and "low-fat" for packaged foods. Now, the terms could mean almost anything, Coplin says.

• Standardize serving sizes among similar foods. Currently, manufacturers can manipulate the serving size to make it appear that their product has fewer calories or more nutrients. However, this might cause confusion about how many servings are in a container. For example, a 10-ounce container could hold 1.25 8-ounce servings.

• Regulate use of "and/or" on ingredient lists. For example, a company will often list several oils that may have been used in making the product. Some of the oils contain more saturated fat than the others, making it difficult for people to limit their saturated fat intake.

Some of the FDA's proposals are already showing up on some food labels, Coplin says. But more changes are in store as the proposals are refined and submitted to Congress. That should happen by this time next year, Coplin says. Manufacturers will probably have a year to conform to the new regulations.

HENDERSON WINS MD'S AWARDS

Every year the Central Maryland's Beekeepers Association generously donates $1000 to a student of Apiculture. This competitive scholarship is destined for research and/or research travel, and is open to students working towards a degree at any College or University east of the Mississippi. This year's awardee was Dr. Carol E. Henderson, from Dyce Honey bee Laboratory at Cornell University. Dr. Henderson is a veterinarian working on her Phd, studying the investment of honey bee colonies in drones. She stresses that grants like this are a great help to students who often have difficulty in obtaining money for their research.

The award was presented at the beekeepers summer picnic held in Jacksonville, Maryland on July 21, where Carol judged the Associations honey show and gave a short presentation on her work.

Typical of Many Northern States

MICHIGAN HAS 1/3 LOSSES

Mite infestation is believed to have killed between 2.5 billion and 3.75 billion of Michigan's bees a third to a half of the state's bee farming population — and this is hurting the state's $220-million fruit and vegetable industry.

A survey of about 55% of Michigan's 2,700 beekeepers indicates the losses among the 110,000 hives kept in the state. Some beekeepers have reported losses as high as 80% from the tracheal and varroa mites.

Feral, or wild, colonies — estimated to pollinate between 50 to 80% of the state's crops — have also been hit hard and some Michigan agriculturalists predict that all feral colonies will be wiped out within the next few years.

The loss of the farmed and feral colonies poses a threat to Michigan's $220-million dollar agricultural crops including its cherry and apple production.

It could also mean economic disaster for state commercial and hobbyist beekeepers who produce a honey crop valued at an estimated $2.5 million annually.

Michigan State University apiarist Dr. Roger Hoopingarner said beekeepers "this past winter certainly lost 50% of their bees" and while there is no way of estimating feral losses their numbers are definitely down.

"There have been far fewer reports of feral swarm cells — 30 to 35% less than in previous years," Hoopingarner said.

"It would appear to have affected pollination," he said. "We've had a bad pollination year. We had bad weather during the period, but that can't account for all the results."

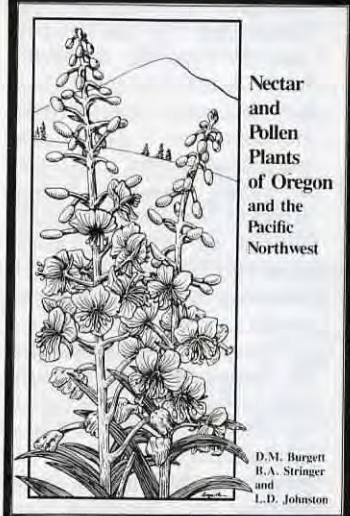
The tracheal mite was first detected in four counties in 1986 and now can be found throughout the state. A quarantine was placed on bee imports from Florida and several other states, but that was lifted in March this year. During the quarantine at least one beekeeper was convicted of importing bees from Florida.

The latest blow to beekeepers has been the arrival of the varroa mite. It has been detected in four counties thus far.

Raj Sitaraman, state Department of Agriculture apiary program manager, said the estimate of one-third losses among beekeepers was extrapolated from the state survey — the estimate of losses being multiplied by the number of hives.

He said the combined effect of the two mites is going to be quite significant in the future.

He fears that in a couple of years — without a concerted effort to eradicate the mites — they will have a serious effect on crop production. "It's definitely going to hurt in a couple of years if things don't change."



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MARKETING PROBLEMS?

When selling honey, keep these hints in mind for more sales

The customer is always right, but sometimes a nudge in the right direction may be needed. We must continually strive to make the customer "aware" of what we want to be the outcome. Factors which may influence customers:

1. People don't like to be coerced. The decision must feel like its theirs.
2. People are less concerned about things which occur naturally. Artificial things should be used to enhance the natural.
3. People accept things with which they are familiar. Education is familiarization with the unknown.
4. People dread certain things like ugliness, sickness, death, lack of friends, food. Farmers are low dread items, use this to create an image.
5. People feel safer when they are in control. A car driver always has less fear than the passenger.
6. People are concerned about fairness of the distribution of benefits. Always have a customer leave with a feeling they've benefitted.
7. People expect things to be morally relevant. Don't be perceived as making money which is morally unacceptable.
8. People perceive children, elderly and motherhood as vulnerable. Create a positive image relative to these three pillars of society.
9. People believe information from a trusted source. Universities, churches and nonprofit groups are trusted sources.
10. People like to be told the truth up front. Don't treat them like children.

STATEMENT OF OWNERSHIP

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Policy Problems

FOOD NOT A GOOD WEAPON

The Administration erred in trying to use food as a weapon against Iraq argues Lynn Daft, former White House Advisor to President Jimmy Carter, and Lyle Schertz, Editor of *Choices*.

Writing in the current issue of *Choices*, a publication of the American Agricultural Economics Association, Daft and Schertz observe that the flow of petroleum is important to farmers and that farmer discontent is at present subdued. They predict, however, that discontent will grow and political opportunities for expressing the discontent will be seized.

The main reason for the prospective growing discontent is that the prosperity of American agriculture is tied to building and maintaining markets abroad, they write. This important relationship has molded U. S. farm policy, affected the U. S. stance in trade negotiations, and, over time, led farm organization leaders to be extremely critical of decisions to use food to punish foreign leaders and their countries. Daft and Schertz expect similar criticism to happen this time.

They suggest that the effect of food embargoes on the attitude of the targeted population, in this case Iraq's can cut both ways. It may "sow the seeds of discontent" about their leaders. However, it could also stiffen resolve and prolong conflict.

Further, the authors contend that, given modern communications, world opinion will work against the effective prohibition of food trade with Iraq. To them, this is the primary reason why the United States should not apply trade restrictions to food. In pointing to the importance of world opinion, they raise the specter of the evening news showing starving Iraqi children this coming winter.

Policy positions of this type are not easily reversed, admittedly. Even so, Daft and Schertz suggest that the Administration "find soon an opportunity to abandon quietly the inclusion of food" as a weapon against Iraq. "For, in the end, U. S. farmers and world opinion will force the Administration to retreat from limiting food imports by Iraq."

HONEY BOARD HIRES NEW EX. DIRECTOR

The National Honey Board, at its fall meeting in Minneapolis hired a new Executive Director to fill the position left vacant earlier this year.

Chosen was Bob Smith who has been working for the Board since this past spring, first as a part-time computer consultant, then full time as Acting Export Director.

Before choosing, five finalists were interviewed for the position (from over 100 applicants), but Smith's qualifications were "overwhelming" according to one Board member.

Smith has considerable experience working as a liaison between non-profit organizations and the government agencies they need to work with to serve their members.

"I'm excited, nervous and completely, enthusiastic about taking on this position," Smith said at the announcement.

He takes over the Honey Board's reins at a time of extreme controversy in the industry and for the Board. The most pressing issue of course is the recent fluvalinate incident and the resulting media exposure. The second issue, though not as immediate is certainly as pressing, and that's the upcoming referendum in June. This vote by industry members will decide whether the Board continues, and if the refund remains voluntary or not.

"He has the complete support of the Honey Board and the Board's office staff," said Sherry Fleming, the Board's new Industry Relations Director, "and we know it's going to get done right with Bob in the Director's chair."

GATT TALKS STALL, AND EC SUPPORTS GAIN

Trade negotiations on agriculture are nearly at a stand-still. Allan Lines, agricultural economist at Ohio State University, says it's difficult to see any agreement coming from negotiations on the General Agreement on Tariffs and Trade. The public positions of the United States and the European Economic Community remain far apart. The United States wants export subsidies eliminated or at least sharply curtailed, limiting the ability of the European Community to export surplus agricultural commodities. But Lines says that would also cut the U. S. Export Enhancement Program, a tool badly needed to keep agricultural exports moving. If GATT changes import quotas to tariffs and then reduces them over time, there would likely be more U. S. imports of sugar and dairy products, and increased Japanese imports of rice, beef and citrus. U. S. corn, dairy and sugar producers would likely be worse off. And it's uncertain whether U. S. rice, beef and citrus producers would benefit, given the rest of the world's ability to produce these products.

Meanwhile, EC supports increase dramatically

European Community farm-price supports were recently set for 1990-91. Dennis Henderson, agricultural economist at Ohio State University, says support prices for most commodities are apparently constant. However, there was actually an increase in the average EC level of support. This was due to "green rates" used to convert Community-wide price supports from European Currency Units into currencies of the different EC countries. In essence, green rates are artificial exchange rates fixed so that no country has to lower farm supports due to a strong exchange rate between its currency and the ECU. For 1990-91, green rates were devaluated to raise supports for weak-currency countries such as Greece and the United Kingdom but were not changed for strong-currency countries such as Germany and The Netherlands. The net result is an increase in average support level among all EC countries.

SEND YOUR NEWS TO THE GLOBE

Manitoba Beekeepers Down, Again

Manitoba Beekeepers Association president Merv Malyon says low prices and poor crops in recent years have produced an uncertain future for the province's apiarists.

He said many commercial beekeepers have been pushed to the limit and now many of them can't afford to get out of the business even if they wanted to do so. Still, the number of commercial beekeepers has fallen by about 30% to 150 since 1985. He said that in the same period the number of colonies in the Canadian province has dropped to about 85,000 from 125,000.

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Display Index

The Lovely Rabbitbrush

Richard Dalby

Rabbitbrush (*Chrysothamnus*) has gotten a rather bad rap in some of the honey plant literature. This shrubby perennial — also known as rayless goldenrod — is found throughout the West, where some 18 species have been identified. Its clusters of small yellow flowers bloom in late summer and early fall and have the ability to survive moderate frosts, a valuable trait.

The bad rap on rabbitbrush is that the honey it yields is dark, bad-smelling, and foul-tasting. The honey I have gotten from rabbitbrush — in the rare year when it yields a surplus — did have a pungent odor and a sharp taste. But the odor seemed not unpleasant and the taste was hardly as bad as often described. Perhaps some rabbitbrush species yield better honey than others.

Rabbitbrush honey — at least that I have harvested — granulates quickly with a very fine grain. As is true of some other strong-flavored honeys, rabbitbrush honey tones down a good deal after it has granulated. To the point where a dab of it tastes right nice on a winter's day on a hot buttered biscuit. In fact, I have one faithful customer who asks every fall if my bees have garnered any rabbitbrush honey for him. He loves the stuff.

But he's usually disappointed. I seldom get enough to extract, though the nectar's rich odor wafts from my hives on fall afternoons. But what honey the bees do gather no doubt helps fill the food chamber for winter. And my bees have never yet complained about the taste of rabbitbrush honey.

But the honey from rabbitbrush is of less importance than the large amount of orange-colored pollen the plant yields faithfully, year after year. This the bees gather avidly and bring back to the hive in large orange pellets. The vivid-colored pollen often leaves a characteristic yellow stain on the surface of light combs.

As is well-documented, overwintered colonies need a large amount of stored pollen to build up rapidly in late-winter and spring, before pollen is available in the field. For many beekeepers, rabbitbrush supplies much of this needed pollen at just the right time of the year.

So, all in all, it seems that the lowly rabbitbrush doesn't really deserve its bad rap. Its honey — though not for everyone — does please a few palates — particularly after it has granulated. And rabbitbrush yields lots of pollen that becomes available just when the bees most need it to pack their pollen pantries for next year's early brood rearing. And, to top it all off, rabbitbrush blossoms add a dash of bright color to many a fall landscape. Not bad for a plant often maligned. The fact of the matter is, bees love rabbitbrush. Just ask, if you can find one that isn't busy when the rabbitbrush is in bloom. □

BOTTOM·BOARD