GLEANINGS IN BEE CULTURE

APR. '88

BEE CULTURE

INSIDE:

POLLINATION

POLLINATING

POLLINATORS

POLLEN

Have You Checked the Quality Of Your Combs Lately?

Dark, old brood combs with many drone cells or damaged spots can cost you money in the long run. Europeans have long believed old combs are a reservoir for disease organisms, so they follow a regular program of comb replacement to maintain top-quality combs in their hives. Even recent U.S. research claims that certain bee diseases may be promoted by old combs.

In addition, broken, damaged and misshapen combs reduce worker brood rearing space and fewer worker bees mean less honey. Old brood cells also have become smaller in diameter to the point that new bees emerging from these combs are smaller in size than those emerging from newer combs.

And, while you're at it, don't neglect your honey super combs. Broken or damaged combs not only mean less honey, but they make extracting a real chore. You know how difficult it is to uncap uneven combs and you've probably watched your extractor vibrate badly or dance across the floor because of damaged or unevenly drawn combs. Lastly, research over the years has proven that old, dark honey combs produce darker honey because of the accumulated residue in the cells.

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(ISSN 0017-114X) Vol. 116, No. 4
115 Years Continuous Publication by the Same Organization

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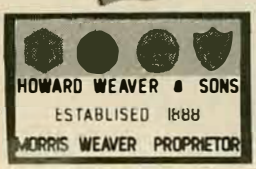

TX Dr. James
UT Prof. Wm.
VT n/a
VA Dr. Richar

ARTICLES

COLUMNS

DEPARTMENTS

NEXT MONTH

May — If April indeed brings those expected showers, this month beekeeping takes off! And *Bee Culture* will be right there with what you need to make it easier.

Package production is going full steam, and in the second part of two articles continued from this month — 'Weavers' and 'Down Under', we'll show how they get 'em ready — and get 'em to you.

The 'Closed Population' technique of queen production is explained next month, too. Although fairly complex, every beekeeper should understand the basics so you know what is what in the next few years.

And, Honey Plants, Funny Beesness, our regular columnists, and a few surprises coming your way — In May!

Oh, yes! One more item. The second annual *Bee Culture* Honey Market Report. This year we've enlisted some outside analysis of the figures we've gathered all year. There are some trends that you should be aware of in pricing your honey — Next Month!

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

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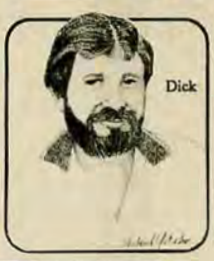

THE A.I. ROOT CO., Publishers
John Root, Publisher
623 W. LIBERTY STREET
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Subscription Rates: United States, one year, $12.49; two years, $23.99. **Newsstand Price: $1.95.** Other countries (U.S. Currency only) $6.00 per year additional for postage. Remittance should be sent by post office money order, bank draft, express money order or check. Published monthly. Discontinuance: Subscription stopped on expiration. Change of Address: Fill out and return form contained inside issue. Articles are solicited. Stamps should be enclosed to insure return of manuscript to author if not printed. *Opinions expressed by the writers in columns or articles are not necessarily those of the publishers.* Advertising rates and conditions sent on request. Advertisers' Reliability: While the publishers do not guarantee advertisements in this journal, over the years few complaints have been received. Microfilm copies available at: University Microfilms, Inc., 300 North Zeeb Road, Ann Arbor, Michigan 48103. Second Class Postage Paid at Medina, Ohio and additional offices.

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THE INNER COVER

There was more than bad weather and good news at the two national meetings in January. I don't want to leave you with the impression (Mar. '88 *Inner Cover*) that nothing of importance happened other than news of the Varroa mite.

As with many groups, next years' officers were elected at both these annual affairs. Once a year, someone is given the nod by a Board of Directors to lead the pack for another year. In the past, those chosen have often been the same, year in and year out. Continuity of leadership is an excellent reason for this practice, and often even finding someone willing to do the job is reason enough to elect them.

But this year was different.

At the Albuquerque meeting the American Honey Producers chose an entirely new group to lead them in 1988. Elected President was Mr. Richard Adee, of South Dakota; Vice President is Jerry Cole; and Horace Bell and Ray Chancey were elected to their Executive Committee.

At the Houston meeting, the American Beekeepers Federation chose Reg Wilbanks of Georgia as President; and Bob Brandi of California as Vice President. Bill Shearman of Florida was selected to fill a vacant spot on the Executive Committee.

I congratulate all of you on your new positions, and support the trust and confidence your membership has placed in you.

But there was one event that occurred during both meetings that bears special attention, and I bring it up not only for these new officers, but for everybody in this industry.

Both groups had, as keynote speakers, members of the political establishment from Washington. And, although their messages were from different perspectives, and with different goals, they both had a common thread. Simply put, they both said that for this industry to accomplish any significant task in Washington, we must speak as a unified group. With opposing factions of the same small industry all trying to get their way — members of congress will turn a deaf ear to all of us. That is, until there is one voice for all beekeepers. This message must not be ignored.

The challenges facing our industry are not small, nor will they go away if ignored. Further, although Washington is not the answer to all of our problems, it can help, if it wants to.

With the two National Associations under new management, and with a mandate from the Washington machine to work for unification, the goal is clear. We must speak with one voice, and no one is in a better position to start that process than these new leaders. But leaders must act in concert with their members, they must have their support. The message is clear, we can listen — or we can go on as before.

The choice is yours.

•

The Rookie

Bob K. is a beginner. A real beginner. He doesn't have his equipment yet, but he knows what he needs, and he has ordered his bees to arrive about the middle of the month. He's already reading some of the books I've recommended, and has a good feel for why some things get done.

Bob is one of the marketing folks here at the company. He has a good feel for, and some real skills in, the numbers game. I often envy how well he does what he does. Bob also has a background in the natural world. He has an appreciation for how things in nature fit together so that

Continued on Page 238

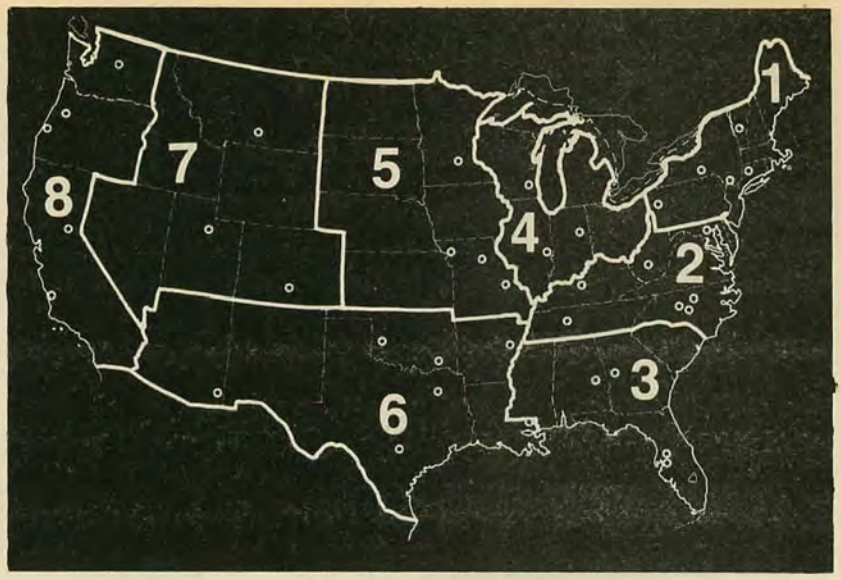
COVER . . . We use the honey bee's drive for survival and growth to our advantage — but this is their *goal. For them, pollination is not a factor — stored pollen is!*

Photo by Dr. Elbert Jaycox, The Bee Specialist

April Honey Report

April 1, 1988

The following figures represent current prices reported by our contributors. They are based on reports from many states averaged out for each region. Where insufficient information is received, no price is shown. The retail prices represent the price of each size jar.



Wholesale Extracted	Reporting Regions									
Sales of extracted, unprocessed honey to Packers, F.O.B. Producer. Containers Exchanged	1	2	3	4	5	6	7	8	R	A
60 lbs. (per can) White	43.00	34.22	24.00	24.30	35.00	36.00	38.80	41.70	24.00-43.00	34.05
60 lbs. (per can) Amber	43.00	33.01	22.80	22.20	33.00	31.80	36.01	34.95	21.00-45.00	32.06
55 gal. drum/lb. White	.60	.49	.41	.41	.49	.58	.63	.53	.40-.66	.51
55 gal. drum /lb. Amber	.60	.41	.39	.37	.40	.51	.55	.49	.37-.60	.47
Case lots — Wholesale										
1 lb. jar (case of 24)	28.50	26.30	23.04	23.40	25.21	22.03	26.95	27.40	22.00-28.90	25.60
2 lb. jar (case of 12)	27.50	24.10	—	22.22	23.62	21.51	28.70	25.75	21.50-31.15	24.76
5 lb. jar (case of 6)	30.00	27.10	23.04	23.20	25.25	24.00	26.60	25.88	22.90-30.00	25.79
Retail Honey Prices										
1/2 lb.	.90	1.15	.79	.79	.84	.85	.95	.89	.77-1.29	.91
12 oz. Squeeze Bottle	1.50	1.36	1.09	1.32	1.24	1.23	1.27	1.27	1.09-1.50	1.30
1 lb.	1.50	1.60	1.19	1.57	1.41	1.47	1.65	1.32	1.19-1.89	1.51
2 lb.	2.70	2.66	2.59	2.57	2.55	2.58	2.86	2.37	2.25-3.00	2.62
2-1/2 lb.	3.35	3.25	—	—	—	3.10	3.86	3.39	3.10-3.98	3.46
3 lb.	4.00	4.08	3.49	3.29	—	3.77	4.29	3.41	3.12-4.90	3.83
4 lb.	5.00	4.85	—	3.29	4.90	4.61	4.75	4.55	3.25-5.00	4.85
5 lb.	6.00	5.88	5.49	5.71	5.75	5.45	5.71	5.48	5.25-6.39	5.70
1 lb. Creamed	1.75	1.49	1.33	1.52	1.69	1.44	1.76	1.55	1.29-1.85	1.58
1 lb. Comb	2.25	1.75	2.77	2.25	2.00	1.90	2.29	2.16	2.16-3.00	2.20
Round Plastic Comb	1.75	1.90	1.91	1.85	1.91	1.85	1.85	1.85	1.50-2.00	1.88
Beeswax (Light)	.95	1.05	1.00	1.05	1.25	.90	.95	1.05	.90-1.50	1.04
Beeswax (Dark)	.85	.95	.90	.95	1.00	.80	.83	.90	.85-1.05	.90
Pollination (Avg/Col)	30.00	21.75	—	26.33	17.00	19.00	23.00	20.00	17.00-30.00	23.15

Honey Report Graph Features

On the far right hand side you will see two different columns. The first, labeled "R", is the price range of prices reported from all contributors — lowest to highest. The second column, labeled "A", is the average price of a particular commodity across all regions. Example: the range in price of a 1 pound jar of honey sold retail is $1.19-$1.89 and the average price across the country is $1.51.

In the comments section you will see a figure called the "Price Index". This figure is only a descriptive statistic that compares ALL regions to the highest region of the month.

Example: Region 1 has a price index of 1.00 this month and remaining regions are compared to that index.

Region 1.

Price Index 1.00. Prices steady to increasing. New England pollination fees are set by the areas cost of living and work required. Using, usually, 3 deeps, colonies are seldom used on pallets. Crops pollinated include apples, pears, plums, blueberries, vegetables and strawberries. Fees can provide significant income compared to annual honey production figures.

Region 2.

Price Index .86. Sales slowing, prices steady to declining as much of specialty honey is gone. Pollination fees dropping this year, few standards used. Apples are primary crop, but vegetables also, with other crops included. Many beekeepers pollinate for no fee, just to get nectar/pollen crop.

Region 3.

Price Index .56. Prices and sales sluggish, with supplies high. Prices being cut on quantity sales just to move crop. Considerable pollination in this area on a variety of crops, but fees are all over the map, along with standards. From 1-8 frame deep to 3-10 frame deeps required. No organization, but similar to most areas.

Region 4.

Price Index .69. Sales and prices in seasonal slump, with supplies strong. Pollination in this region is big business, with apples, cherries and other tree fruits demanding much. Most by local beekeepers, but some outsiders do work. Standards set by growers, no uniform contracts.

Region 5.

Price Index .81. Prices steady, with sales steady to improving on retail levels. Many use government programs. Pollination is important in parts of the region, but much is done for free, for the nectar/pollen crops. Some apples and vegetables for fees. Many out of region beekeepers in area.

Region 6.

Price Index .81. Sales and prices steady. Erratic winter has required feeding many colonies. Early flows in most areas moderate to strong. Pollination of some commercial crops in this area.

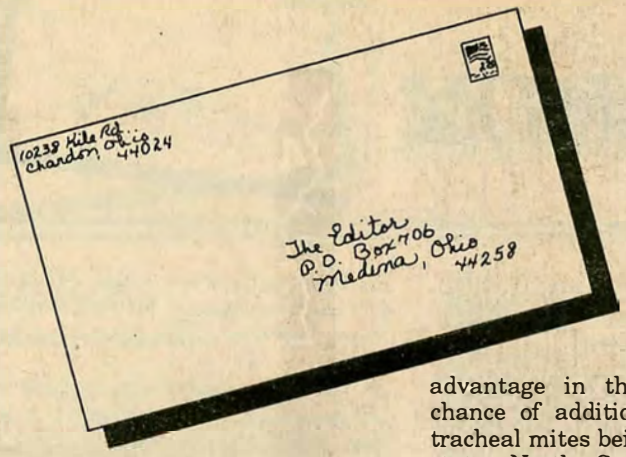
Region 7.

Price index .93. Sales strong, prices increasing a bit as local sources become depleted. Early spring, good moisture in most areas helping spring build-up. Many MT beekeepers out west pollinating oranges, apples, alfalfa and other commercial crops. Locally, apples, cherries, sanfoin, and vegetables are pollinated by local beekeepers.

Region 8.

Price Index .91. Prices and sales strong, and supplies steady. CA pollination activity strong in many areas and many crops. Almonds strong but fast this year, along with apples. The vegetable business is also mammoth. Pollination is big business in this region, and there are some standards and contracts in place. Probably more organized than much of the country.

MAILBOX



Foreign Correspondents

Being impressed by the memorable atmosphere of Apiarian Congress in Warsaw, our Association assembling more than 2,000 apiarists would like to have a correspondence contact with other apiarists knowing German, Polish or Russian language. We kindly ask you for help concerning such contact with apiarists interested in a practical exchange of the modern apiarian practice.

The Congress in Warsaw was an excellent opportunity to know Polish apiarian achievements, however, we are able to submit more details concerning this matter. On the other hand, we are interested in achievements and results of your apiarists. Help us please to obtain by publishing our address in your magazine. Maybe in your country there are apiarists of Polish Origin.

Thank you for your help.

Kierownik Biura WZP
mgr. Franciszek Wyrrea
64-800 Chodziez
Ul. Paderewskiego 2

An Explanation of the North Carolina Bee Quarantine

On February 5, 1988, the N. C. Dept. of Agriculture imposed a quarantine on the shipment of all honey bees into North Carolina. The reaction to that quarantine from out of state sources has ranged from mild ridicule to outright condemnation, and so an explanation (not a justification) of the quarantine might be appropriate.

First, a brief discussion of the actual quarantine. The quarantine was imposed to decrease the chance of Varroa introduction into North Carolina by beekeepers from other states. The quarantine also has a secondary advantage in that it reduces the chance of additional infestations of tracheal mites being brought into the state. North Carolina is currently working on the elimination of the third outbreak of tracheal mites in the state, and all three of the infestations are traceable to the movement of mite infested bees into the state. The quarantine also provides the state beekeeping agencies and the beekeepers with some practice in dealing with future possible quarantines or prohibitions on the movement of bees due to the arrival of the Africanized bees into the U.S. The quarantine was endorsed by the N. C. State Beekeepers Association and the commercial beekeepers of North Carolina.

The quarantine currently prohibits the movement of all honey bees into North Carolina but it does contain provisions for the future shipment of queens into the state and the immediate movement of bees through North Carolina to other destinations. Out of state queen breeders who enter into a consent agreement with the N. C. Dept. of Agriculture to have their bees inspected by N. C. bee inspectors may be authorized to ship queens into N. C., and a list of such dealers should be approved by June of this year.

Obviously, there are a large number of drawbacks to such a quarantine. Some researchers say that a quarantine would be ineffective and would only create more problems for the industry. The N. C. quarantine does raise the possibility that queen breeders and package suppliers might have to contend with 50 different sets of regulations. Interstate commerce is affected and N. C. beekeepers may have to pay higher prices for locally produced queens and packages or there may even be a shortage.

In spite of the disadvantages, N. C. beekeepers believed that some action was necessary for three very simple reasons: 1) the initial movement of both the Varroa and the tracheal mites throughout the U.S. is in large part traceable to the movement by beekeepers, 2) the three infestations of tracheal mite found in N. C. were linked to the movement of mite infested bees into the state, and 3) the USDA which has overall responsibility for protecting the bee industry against imported pests had waited for over three months (as of the imposition on the N. C. quarantine) from the detection of Varroa mite in Florida without taking any meaningful action. The N. C. quarantine is not the final solution to the mite problem and it will be revoked or modified based on action by the USDA in setting up reasonable guidelines on the Varroa mite.

John Ambrose

MAILBOX

Pollination Figures

Several times in the past year or two I have read that honey bees are responsible for the pollination of crops in the United States at a value of $19 billion dollars. The accompanying tables give the official U.S. Department of Agriculture production values* - a long way short of 19 billion. Even if we add such doubtful crops as cotton, peanuts, grapes and vegetable seeds, the values are still too low. (Also not included in this list are buckwheat, alsike clover, berseem clover, rose clover, white dutch clover, trefoil, crown vetch, blueberries, casaba and citron melons. There are no adequate figures available for these crops.

Value of Some Pollinated Crops

Crops	1980 Dollars
Alfalfa seed	114,652,000
Alfalfa hay	129,500,000
Sunflowers	33,766,000
Almonds	473,340,000
Cucumbers	183,533,000
Clovers (all types)	21,550,000
Ledpedeza	2,628,000
Hairy Vetch	868,000
Apple (commercial**)	757,027,000
Apricot	33,705,000
Peach	368,004,000
Pear	174,876,000
Cherry	135,460,000
Avocado	121,293,000
Cranberry	88,674,000
Citrus:	
Orange	1,304,177,000
Grapefruit	300,175,000
Lemon	161,319,000
Lime	13,805,000
Tangerine	37,559,000
Tangelos	26,816,000
Melon:	
Honeydew	42,864,000
Water	149,757,000
Total:	$4,675,348,000

*Agricultural Statistics, UDSA, 1981, figures rounded to nearest thousand.

**page 434 of Agricultural Statistics, 1981 for the fruit crop figures.

Everett Oertel
Baton Rouge, LA 70808

Guaranteed?

In response to the February 1988 article "Improve the size of your honey crop", Mr. Knox suggests buying package bees, which is all right for the hobbyist with a few hives. However, you can't buy bees at $8.00/lb. and sell honey for 40¢ a pound and make a profit.

Hives should have more than the 3 to 6 pounds of bees by March 1 as Mr. Knox suggests, but even if they don't, a 2 lb. package or a four frame nuc will build to full strength in 10 weeks.

We keep 500 hives in NW PA for honey production. In order to get them to proper strength by the honey flow (May 1st), they must be packed not only for wintering but for extra honey we get.

We unpack the end of April and super. We pack in a wooden frame case made up with covered felt paper and a metal cover 20" x 24". This way of wintering should work in any area where the weather keeps hives from building up in the spring; of if you are losing hives during the winter.

Larry Curtis
R. D. 3, Union City, PA 16438

Will the REAL meaning of resistance . . . .

Steve Taber defines bees that uncap and remove brood killed by freezing as disease resistant (February, page 69). Does the italicized *resistant* mean resistance to the disease organism itself? Huck Babcock solves the semantic problem with a disclaimer in his ads that the bees are *not* resistant to disease.

Does brood continue to be reinfected from spores within the hive, and/or brought in from disintegrating brood dropped around the hive? Would the colonies with hygienic factors serve as reservoirs for infecting other colonies?

Toge Johansson
R.D. 1, Box 256A
East Berne, NY 12059

MAILBOX

Battery Box Reincarnated?

I read with interest the article concerning the Riteway Queen Shippers which was published in two other Bee publications recently. What really caught my eye was the fact that there before me was a picture of a "Battery Box" exactly like the ones we have been producing for some ten years. Therefore I would have to say that this box is not new to the industry.

During the development of this box, which was done in cooperation with Weaver Apiaries of Navasota, Texas, we displayed it to as many shippers of queens that we could. Although it has not been advertised through the media, this box has been displayed at various meetings of queen breeders around the country. Many queen breeders in California have known that the box was available since some have ordered and used them in the past several years.

I have pointed these few things to you so that perhaps you may see that in reality this box is really not something new.

Thank you for your time and I wish you the very best.

Joseph F. Rossman
Rossman Apiaries, Inc.

A Compromise Is Needed

We are writing this letter in response to the recent ban on the importation of honey bees into Canada from the U.S. We understand the Canadian government's responsibility to the Canadian beekeepers, however, we believe that under the circumstances in which the government is reacting is quite the contrary to what all beekeepers want.

We are beekeepers in California and we bring up our own bees to our businesses in Canada. We belong to the Calif. Bee Breeders Assn., and are located in the 17 county controlled area, and we participate in having our colonies tested twice a year for both the varroa and the tracheal mite. This ban affects us all. We are not able to operate our businesses in Canada, but the Canadian government can include deficiency payments to the beekeepers, which enable them to lower their honey prices and to renew interest from U.S. packers, which in turn will probably import more honey. This will hurt the American beekeepers even more severely. Combined together these measures will put a lot of beekeepers out of business. There must be a way in which we can reach a compromise. This is not an issue to be taken lightly. A lot of beekeepers depend on package orders from Canada for their livelihoods. We are on both sides of the fence. We own businesses in Canada and California.

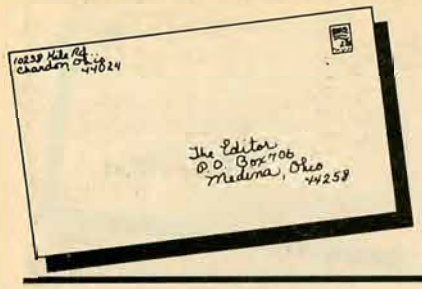
Therefore, we need support from anyone and everyone who has anything to do with bees and honey. If you eat honey, support your beekeeper. Your response would be greatly appreciated. Thank you!

Joe Fox
c/o Rochfort Bridge Honey Bees
Box 90, Rochfort Bridge,
Alberta TOE 1YO
and J. D. Fox Apiaries
4831 Kentucky Lane
Fair Oaks, California 95628

A Clarification of The Paige-Laidlaw Closed Population Breeding Program

We would like to clarify some of the comments recently made by Mr. Taber concerning the Paige-Laidlaw Closed Population Breeding Program (CPBP). Vaca Valley Apiaries has been successfully using this breeding system for five years and we are impressed with both the results and practicality of the program. It is a new and innovative approach to bee breeding and has solved many of the problems of breeding programs used in the past.

Mr. Taber stated he did not know why the program was named; "Closed Population Breeding Program". This name was chosen to signify that the program works with a large population which is free from the uncontrolled introduction of new stock. It is not exclusive in that new stock cannot be added to the population after sufficient testing. New stock may be included in the population to increase the number of sex alleles and/or increase the frequency of a specific trait



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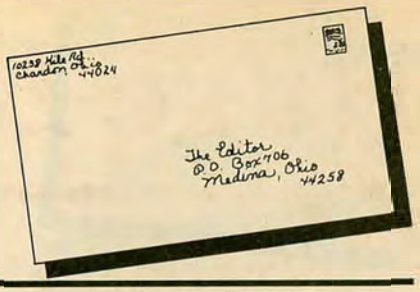

in the population.

Mr. Taber's explanation of the system is confusing. To clarify the basic program, a brief summary of the CPBP is as follows: a test population of 200 to 250 colonies is established annually. From this test population the top performing 35 to 50 colonies are selected. The queens from these selected colonies become the breeders. Five to ten daughter queens from each of the selected breeders are reared and inseminated to drones collected from a pool of all the selected breeders. This establishes the next generation of 200 to 250 test colonies. The top performing 35 to 50 test colonies are selected as breeders and the cycle is repeated each spring. The result is a continuous and progressive improvement in the performance of the population over time.

Mr. Taber states that daughters of each breeder must be selected each generation. This is not absolute. The use of homogenized semen gives each queen an equal representation of the population. By using this technique it is not necessary to choose daughter queens from each of the 35 to 50 breeders to represented in each test population.

Further, he implies that queen loss is a problem in this program, it is not. The beauty of this system is that it is flexible. You are not dependent on a few select queens as in past systems. If queen loss is experienced, (which can be avoided by proper insemination technique and post-insemination care) the genes of that particular queen are not lost, they are still represented within the population.

Mr. Taber also states that both record keeping and the number of inseminations are excessive. Record keeping is tedious, but necessary for any breeding program. We have found that the use of a computer will minimize the amount of work. There are a large number of inseminations necessary to maintain this program. This is relative to your operation. If you have the training and equipment, the benefits far outweigh the expense. Keep in mind that these queens more than earn their keep by heading productive, income producing colonies as well as act to improve the stock. This has not been possible with past programs.

A large number of inseminations can be accomplished efficiently with use of a large capacity syringe. We annually instrumentally inseminate over a thousand queens, half of these are to maintain the breeding program and produce breeder queens for our customers. The additional inseminations are requested custom orders designed to help other beekeepers maintain their programs and to help researchers requiring specific crosses. We find this technique to be practical and economical on a large scale.

The computer study of the Page-Laidlaw system made by Mr. Taber appears to have missed the basic concept of the program. The program is not designed to look at specific genes and it is not designed to select for spontaneous mutations. The program is designed to enhance desirable, naturally occurring characteristics in the population. The time factor required to gain these desirable characteristics in your population will depend upon a variety of factors; the frequency of occurrence of these traits within the population; the type of crosses made; the number of traits selected for; and the enhancement or dilution by introduction of new stock.

The program does not select for a single gene effect as implied by Mr. Taber. The CPBP is designed to select for behavioral traits which are the result of an unknown combination of many genes. By selecting the top performing colonies of each generation, we are including the combination of traits responsible for these, and including the combination of genes responsible for each of these traits.

The major point Mr. Taber seems to be missing is that the honey bee responds to selection regardless of the system used. The major difference between the Page-Laidlaw system and systems of the past is that you are working with a large population instead of a few queens. There is no end product — you are able to select for the continuous improvement within that

Rave Reviews

Beekeeping and Equipment

A 60 minute video (VHS or Beta) available from Bee Films Ink, P. O. Box 3315, Lee Hall, VA 23603

Bee Films Ink of Lee Hall, VA announces the release of the first in their series of beekeeping how-to films. This 60 minute VHS or Beta tape features information on tools, equipment and assembly, clothing, locations, harvesting, extraction and bottling honey needed for a beginning or inexperienced beekeeper.

Included are spots on basic assembly of commonly used equipment and clothing required. Also, basic tools used in handling bees.

The section of how to install a package is basic, but thorough. The section on locating a hive talks about both backyard and outyard pros and cons.

Honey harvesting looks at removal by brushing or blowing bees, and talks about both. Uncapping and extraction are also discussed, along with points on bottling. Finishing is a short section on public relations.

This tape, though a bit rough in spots, and uneven in some production areas, makes an excellent addition to any beginning beekeepers library. It is also good for groups interested in learning basic beekeeping skills in the areas covered.

This is not a 'raring to go, get fired up' tape, but rather, offers sound, practical advice on beginning beekeeping.Δ

Beekeeping of the Assassin Bees

1986. Dario Espina. Editorial Tecnologica de Costa Rica, Apartado 159, Cartago, Costa Rica. 170 pp. $US9.00 postpaid. Paper. Translated from the Spanish, "La abeja africanizada."

The idea behind this book is a good one — to help Spanish-speaking people manage the African bees as they move through Central America and Mexico. The result leaves much to be desired. Both the writing and the translation are not clear, and portions of the book are difficult to understand. Much of the book, about one-third, deals with European bees, and the management proposed even for them is often questionable. For example, the author proposes removing combs from the brood chamber twice a year (exchange?) and uniting small colonies rather than trying to stimulate their growth.

The illustrations are often fuzzy and many do not fit the topic of the accompanying text. The important section on counteracting defensive behavior is an odd mixture of good and poor advice that often lacks important details. The author's recommendations for swarm control include using a queen and drone trap but preventing drone production so that the trap will not be filled with decomposing drones!

One good idea in the book: introduce selected bees from Brazil. The author notes that this " . . . would be ideal," but the public and authorities would react unfavorably.

If you would like a curiosity for your bookshelves, buy this book. It will not help you to learn how to keep Africanized bees.Δ

Mailbox

population and new traits can be added to your gene pool.

We have found the Page-Laidlaw CPBP to be practical and commercially feasible, and are impressed with the results we have been able to attain in developing our New World Carniolan line.

Susan Cobey and Timothy Lawrence
Vaca Valley Apiaries,
Instru. Insemination Service
6745 Bucktown Lane
Vacaville, CA 95688

Ed. Note: For a review of the methodology and selection methods practiced by Vaca Valley Apiaries based on the Page-Laidlaw program, see the upcoming May, 1988 issue of *Bee Culture*.

RESEARCH REVIEW

DR. ROGER A. MORSE • Cornell University • Ithaca, NY 14853

"Swarms of Africanized Bees appear to be quite different from European Swarms"

I spent ten days in mid-January in the area of Tapachula, Chiapas State, Mexico. This is in the southwestern corner of the country, only a few miles from the Guatemalan border and near the Pacific Coast. Africanized bees had been reported in the area for the first time in September 1986 (Moffett et al., 1987). Ninety-five percent of the swarms and twenty-five percent of the colonies in the area are now said to be Africanized.

I was there as part of a Cornell University research project. Our program is financed by a contract from the U. S. Department of Agriculture under the title Africanized Honey Bee Swarm Orientation and Control.

We saw many apiaries and looked at bees in two of them near Tapachula; one had colonies headed by European queens while the other apiary was Africanized. The colonies of Africanized bees were stronger and had more honey. However, inspecting colonies in only two apiaries is not sufficient to make any real comparisons between the bees. The brood patterns in the colonies of Africanized bees were a delight to the eye. The brood was compact; the queens had missed only a few cells when laying. Adjacent brood was of a similar age, as it should be.

Most of the colonies of Africanized bees I looked at were honey-bound — that is, there was solid honey above the brood and no room for expansion of the brood nest. Under the circumstances, the colonies of Africanized bees could be expected to swarm soon. I saw no signs of any diseases in either apiary or in any of the other bees we looked at; *Varroa* mites have not been found in the area as yet. Beekeepers in the Tapachula area told us they did not yet have sufficient experience with the Africanized bees to make a judgement about them; however, at present, they are not disappointed in them.

The colonies of Africanized bees were aggressive and much like those I have worked with in Brazil. We wore good bee suits and used lots of smoke. We saw some of the large, Brazilian-type smokers but they are not common yet; I expect bigger smokers will soon become popular. When we finished in the apiary of Africanized bees we walked into a mango grove to discourage the bees from following us. However, like African bees elsewhere, they persisted and it was more than ten minutes before bees stopped following us.

Bait Hive Studies

The Mexican government has designed a bait hive for capturing swarms of Africanized bees in an effort to control the advance of the bees. We observed that a number of these hives were occupied with bees. As regards European honey bees, we have yet to design a perfect bait hive — a hive that bees can't refuse — or even a near-perfect one. Part of our studies in Mexico involves testing various parameters of bait hives to determine how Africanized bees might be different from European ones. We are placing bait hives in pairs and varying one item only in each pair. We are checking large bait hives against small ones, large entrances versus small ones, position of the entrance, and other factors that we know European bees can measure.

Capturing Swarms

While I was in Mexico we took several swarms from the Mexican bait hives. Also, four swarms in trees in the city of Tapachula were observed after they were reported to us. The bees in the swarms were moderately engorged and easy enough to work with, as are bees in swarms in this country. The information I have is preliminary and it is much too early to make any strong statements about swarms of Africanized bees in Mexico. One item, which we will report on more fully at another time, was that there were drones with all four of the free-flying swarms. In one swarm of 2,400 bees, we found that 3% of the population were drones. Thus, it appears that one aspect of the spread of Africanized bees through swarming is that the swarms are carrying drones, and this can have a profound effect on Africanization of an area. In this regard, swarms of Africanized bees may be quite different from swarms of European bees, especially small swarms.

Africanized Bee Mating Behavior

It has been clear to me for several years that in an area where there are Africanized and European bees, European drones rarely mate with queens of either race. We have no notion why this is true but certainly it is a fact. Only 26 African queens were introduced into Brazil in 1956 and now there are well over two million colonies of Africanized bees in South and Central America. Africanization of the bees is taking place at a rapid rate. So far as I can see, there is little to stop their movement through Mexico.

Accompanying me were: Dr. Scott Camazine, who will stay in Tapachula for over a month; a graduate student Francis Ratnieks; and an expert beekeeper, Miguel Angel Piery from Argentina, both of whom will work in the area for nearly four months. Steve Zimmerman, commercial beekeeper and honey packer from Ithaca, helped us get our truck and equipment to Tapachula and also assisted in the initial stages of our project. Dr. Richard Nowogrodzki from our laboratory expects to go to Mexico shortly.

We were very much pleased with the cooperation we received from the Mexican authorities in the area. Francisco Choy Hernandez of SARH (Secretaria Agricultura Resources Hydrolica), who is in charge of the bait hive trapping program, has shared with us their vast data; from this we will be able to reconstruct exactly how and when the area became Africanized. SARH is also allowing us to take data from bait hives as they collect and bring them to their center.

Ignacio Quiadirello, who is in charge of the research arm of the Mexican government's effort to study and control the Africanized bees, has given us laboratory and office space. He has also shared data that has been collected on Africanized bees. Thomas Andre of APHIS (Animal Plant Health Inspection Service) of the USDA Mediterranean Fruit Fly Laboratory in Tapachula has also given space and assistance. All this cooperation makes working in a new area much easier. Beekeepers have been most helpful. They have allowed us to inspect their apiaries and have also discussed the Africanized bees with us freely.Δ

Reference

Moffett, J. O., D. L. Maki, T. Andre and M. M. Fierro. The Africanized bee in Chiapas, Mexico. American Bee Journal 127:517-519, 525. 1987.

Pollination *IS* Changing

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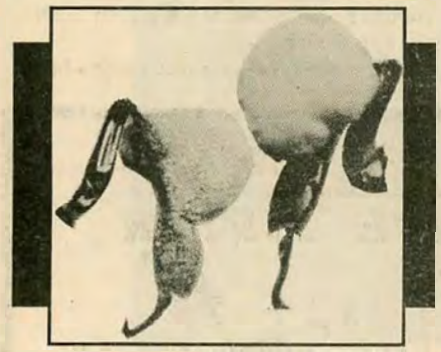
The photograph on the cover is more than a picture of a cell full of pollen in a honey comb. For the bee it represents a nutritious protein food and, in turn, brood and bees. The pollen can be transformed rapidly from raw material to a force of foragers visiting plants and collecting nectar to be converted into honey. For the plants involved, or their caretaker, the cell of pollen represents potential fruit, vegetables, and seeds to nourish some part of the animal kingdom and to carry on the plant line. In the two roles, the bee-collected pollen also represents pollination in both of its meanings: 1) the transfer of pollen from the anther of one flower to its own stigma or that of another flower, and 2) the service of providing colonies of bees to pollinate a fruit, vegetable, or seed crop.



Gigantic pollen loads on rear legs of worker honey bees, front and back views.

Pollination is changing. Perhaps the greatest changes are within view if we look ahead only a short period. Spring is a good time for us to look at new ideas and observations about pollination, as well as at some important older ones. Then we can consider what lies in the future for the grower who uses honey bees for production of his crop and the beekeeper who provides them.

Fruits and Nuts

Growers of fruit and nut crops have not always given credit to the value of bees and other insects in pollination. Not so long ago, I walked in an Illinois apple orchard with a grower who asked, "Don't you think a good breeze through the trees sets just as many apples as those honey bees of yours?" While he may have been trying to get a rise out of me, it was evident that he really had some doubts about the need for bringing hives of bees into his orchard. His need for rented bees was reduced by the wooded area around the orchard and the extensive uncultivated land nearby, home areas for honey bees and wild, solitary bees.

The economic realities of producing more profitable crops, along with the advise of dedicated research and extension personnel in the field of pollination, are changing growers' attitudes. They have learned, for example, that bee behavior must be taken into account when planting new orchards or improving the yield of old ones. Foraging honey bees tend to work along the tree rows, not across them. They do not visit large numbers of trees, but concentrate individually on only one or two trees. The field bees disperse best throughout an orchard when hives are placed in groups, and there is earlier and better flight if hives are in the sun and protected from the wind.

Probably the most important lesson growers have learned is that all the bees in the world cannot set an optimum crop of fruit if they do not have access to an adequate amount of quality pollen, available in a well-distributed pattern and on a timely basis to assure cross-pollination and maximum effectiveness of the bee pollinators. In other words, there must be sufficient pollinizer trees, usually within the rows of the main variety or cultivar, that will bloom synchronously and reliably every year along with the trees that provide the principal crop.

Research in several states and at least three countries has focused on improving the pollination of apples by using flowering crab apples as pollinizers. By selecting from as many as 3000 different varieties of crabs, horticultural researchers have come up with trees that bloom at the right time and offer plenty of attractive pollen to visiting honey bees. They also bloom reliably each year. The selection process removed all pink- or red-flowered varieties from consideration because the bees on those blossoms did not cross over to the white blooms of commercial apple trees. Blossoms of some crab varieties are actually repulsive to honey bees. With the new selections, a grower can interplant the smaller crab apple trees within the rows of a solid block of a commercial variety. He can use three different selections to make sure that at least one will always be in bloom at the right time, and he need not worry about harvesting the fruit or changing his regular orchard practices for those pollinizer trees. A recommended pattern is one crab per 100 feet of row with the one in the next row offset by 50 feet. Grower acceptance of the use of crab apple pollinizers has been so good that the trees are sometimes hard to find in the market.

Why apple crops fail. Pollinizer tree at left lacks blossoms because of heavy bloom the year before.

An odd mutant tree may become important also as a pollinizer. It is a sport of the McIntosh variety called the Wijcik spurred upright apple. This is a tree without branches, almost a leaf-and fruit-bearing pole that can be planted closely together or put between trees in a row to provide pollen. The Wijcik apple tree may make possible a simplified mechanical harvesting method for apples in the future.

Pollen inserts have long been used as a means of putting compatible pollen onto outgoing bees in orchards without sufficient pollinizers. Newer models make no attempt to separate

incoming from outgoing bees because of the results of studies by DeGrandi-Hoffman and Hoopingarner on pollen transfer between the bodies of bees within the hive. They believe that cross-pollination occurs in large part *in the hive* and that good crops of apples can be produced even when the compatible varieties are planted in large blocks adjacent to each other. Their assumptions appear correct if there are ideal conditions of bloom, weather, and other variables in the orchard. The increased interest in

Putting live pollen into a pollen "insert", or dispenser, in a mis-planted orchard.

more and different pollinizers, however, just emphasizes the need for being ready to set a crop under the worst possible conditions in relation to bee flight and pollen availability nearby.

Honey bees are strongly attracted to cherry blossoms, so much so that grower Gary Ormiston plans to use fewer colonies and remove them earlier from his Washington orchards of Rainier cherries. These light-color cherries are sold in special packs of fruit with a *minimum* diameter of one inch. Too many bees for too long during the bloom produce many small, less valuable cherries. It will be a challenge to decide how many "bee-hours" or "bee-days" to use.

In contrast, bees do not like ordinary pears (*Pyrus communis*) because their nectar is low in sugar content and may have a disagreeable odor. Not so with the new Asian pears (*Pyrus serotina*). Their blossoms are very attractive to bees; the growers who are planting large numbers of Asian pear trees hope the fruit will continue to bring a premium price in the market.

Wild, solitary bees are heavily touted to replace honey bees in fruit orchards. Frank Parker of the U.S. Department of Agriculture says that just 250 blue orchard bees (*Omis lignaria*) can replace the 80,000 honey bees needed to pollinate a 1-acre fruit orchard. Unfortunately for growers, it takes 5 to 10 years to produce enough bees to handle the pollination of large orchards.

Alfalfa Seed

Honey bees are not effective pollinators of alfalfa in most states of the U.S. and Canada except for the far west. Seed was produced originally only as a byproduct of alfalfa hay, with very low yields. As western farmers began to specialize in alfalfa seed production, they learned from early research by George Vansell, USDA, that honey bees could produce impressive yields of alfalfa seed, especially in California. They have been using thousands of colonies of bees for alfalfa seed production ever since.

Under some conditions, honey bees do not perform as well as expected. Sheesley, Atkins, and their colleagues wondered if they could improve the bees' performance by providing nearby water while the colonies were in alfalfa fields in the warm central valley of California. The placed barrels of water, 2 barrels/45 acres, in 4 of 7 fields in their study. In those fields where extra water was made available, the researchers found more bees on the flowers (up to 5 times more!) and at least 45 pounds more seed per acre than in fields where the bees had to find water in irrigation ditches within a half mile of the fields. Sheesley et al did not consider honey production in their study, but it should have increased also where water was provided because more bees could concentrate on nectar collection rather than gathering water.

Economists have not always been

sympathetic and supportive of the need for and the value of bees in agricultural production. Alan Olmstead and Donald Wooten changed all that in 1987 when they wrote "Bee pollination and productivity growth: The case of alfalfa" in the *American Journal of Agricultural Economics* (Vol. 69, No. 1). In a fascinating paper, they point out that commercial pollination has played a major role in increasing productivity for a broad spectrum of crops. They use alfalfa seed as their example, but note that if honey bees were used only at densities efficient for honey production, the yields of many crops would drop by one-half. Without bees, they could be reduced by more than 90%.

Olmstead and Wooten say that beekeeping is a competitive business with one of the lowest financial costs of entry of the agricultural enterprises. And although the beekeepers' returns were only equivalent to those from honey production outside of pollination, the growers in the early days of the alfalfa seed boom were receiving a return of about 600% from their expenditures on colonies for pollination.

The Future Of Pollination Services

Mike Burgett, of Oregon State University, and Roger Hoopingarner, of Michigan State University, have written recent discussions about changes they foresee in pollination in light of changes in U.S. beekeeping. Burgett sees a less-than-optimistic future for pollination because of uncertainties about the effects of tracheal mites and the changes in management that he expects when Africanized bees are used to pollinate crops. Although he thinks that fewer colonies may be available for rental, he does not think that pollination fees will keep up with beekeepers' expenses, including more requeening. Burgett's article was written before the discovery of Varroa mites in the U.S.

Hoopingarner's ideas about the future are significantly influenced by the effect he sees from the Varroa infestations. All wild (feral) colonies of honey bees will die, along with all managed colonies that are not treated to control the mite. Based on data from other states, he thinks as many as 50% of the colonies in the U.S. are feral ones and, as a result, more nectar will be available for honey production. Far fewer colonies will be available for free pollination of commercial and homegrown crops, which leads Hoopingarner to believe that prices for pollination services will rise. He did not discuss the effects that Africanized bees may have on the future of pollination.

I believe, too, that Varroa mites will probably create a greater need for pollination services and that prices will rise as a result. Tracheal mites pose no threat to pollination except through restrictive quarantines against movement of bee colonies within and between states.

Africanized bees are not a serious threat to pollination if beekeepers and Federal quarantine officials realize that we must make controlled importations of African stock that has been subjected to selection for gentleness and production for about 32 years in Brazil. These bees are the basis of a pollination industry there that is bigger and better than ever before. And no wonder. While the official USDA line has been that African bees do not pollinate plants, their own people (Pesante, Rinderer, and Collins) have found that twice as many Africans collect pollen as do bees from European colonies, even under adverse conditions. This increased pollen collection means more pollination and also more brood and bees for subsequent honey production.

If we are afraid to bring in proven strains of Africanized bees, we will still overcome the difficulties that Burgett speaks so pessimistically about — defensive activity, fewer colonies and wider spacing, swarms left behind, and the need for larger hives. It will just take a few years longer.

With increased grower interest in using honey bees effectively and the ability of beekeepers to modify the management of their bees to suit changing conditions, pollination is truly changing and the future looks brighter than ever.Δ

Testing Your Beekeeping Knowledge

By CLARENCE H. COLLISON
Pennsylvania State University • University Park, PA 16802

As spring rapidly approaches, many new individuals will become beekeepers for the first time in their lives. Some of these individuals have contemplated getting bees for several years while others will begin without giving it much advanced thought. Regardless of how the decision was made and how much reading and preparation the individual has done in getting ready, the new beekeeper will have to make many decisions in regards to equipment, sources of bees and equipment, and type of bees to get. For the experienced beekeeper, these same questions seem elementary and are given little thought until they have the opportunity to help a new beekeeper or are asked to participate in a beginners bee school.

Please take a few minutes and answer the following questions on the topic of "Getting Started in Beekeeping" as a means of preparing for a new beekeeping season. The first five questions are true and false. Place a "T" in front of the statement if entirely true and an "F" if any part of the statement is incorrect. (Each question is worth 1 point.)

1. ___ When an individual purchases a 3 pound package of bees with queen, the package is made up with a mated queen and her offspring.
2. ___ A nucleus colony (nuc) is different than a package in that it has 3-5 drawn combs, bees of all stages of development, and a laying queen.
3. ___ An individual needs to decide on the type of honey they are going to produce prior to purchasing frames and foundation.
4. ___ In packages, queens are caged separately from workers and provided different sources of food.
5. ___ The various races of the European honey bee, *Apis mellifera* can interbreed.

Multiple Choice Questions
(1 point each)

6. ___ The greatest period of activity in the United States for the package bee industry is: A) January - February; B) April - May; C) February - March; D) March - April; E) May - June
7. ___ Package bees upon arrival should be fed and stored at ____°F until they can be installed in the hive. A) 60-70; B) 70-80; C) 40-50; D) 80-90; E) 50-60.

Please explain why the following practices are recommended in the installation of packages (1 point each).

8. When available, capped brood should be added to a newly installed package.

9. Packages should be installed in late afternoon or early evening.

10. Prior to installation, a package should be sprayed with water or sugar syrup.

11. After a package is installed, the colony should not be disturbed except to see that the queen has been released and to feed it for 7-10 days.

12. Name four fuels that are commonly used in smokers (4 points).

13. Why is it recommended that a beginner start with more than 1 colony?

14. What are two uses for nucleus colonies other than starting new colonies? (2 points)

15. What are two advantages of purchasing nucleus colonies rather than packages? (2 points)

Extra Credit Questions

16. ___ Starline honey bees are three-way hybrids developed from inbred lines derived from the Carniolan race. (True or False, 1 point)

Please match the following honey bee races with the correct colony description.

A) Italian; B) Caucasian;
C) Carniolan; D) Buckfast

17. ___ Overwinters as small colonies and with small food consumption. Brood rearing starts with the first income of pollen and fast development occurs thereafter.
18. ___ Colonies start to develop early in the spring and maintain a large brood area regardless of flows until late fall.
19. ___ Colonies do not reach full strength before mid-summer, thus have a weak inclination to swarming.

ANSWERS ON PAGE 237.

PROFIT $ IN POLLINATION

There's always room for more ways to make money with bees. Finding new markets to increase honey production is one proven method. Another is to actually sell bees. Making up packages or nucs to sell each spring can be a good source of income every year. So too can becoming a pollinator. Renting colonies for at least one, but better yet, two crops, can add a significant chunk of income to any beekeepers bottom line.

But what about all three at the same time — selling bees, pollination and honey production — and all profitable!

With careful planning right now, you can be selling nucs or packages, pollinating and making honey with the same batch of colonies this season — and increase your bottom line this fall.

Impossible? Far fetched? Too much work? Not according to a study recently completed in Canada*. We've adjusted for current U.S. dollar values, honey prices and nuc and package prices to make this information relevant to beekeepers south of the border.

Basically, the researchers were interested in finding out if using colonies for only honey production was more or less profitable than for both honey production *and* pollination. They also incorporated an added benefit — shaking packages or removing frames for nucs from colonies used for just honey production and both production and pollination.

What they found may surprise you!

But first, let's get some definitions out of the way:

- **Pollinating Colonies:** colonies used for pollination were used for 2 crops each, returned to the apiary for the remainder of the season and managed for honey production. All colonies were a minimum of 8 combs of bees and 5-6 combs of brood.
- **Nucs:** made in April, 2 frames of brood, 2 frames of honey and pollen, and enough bees to cover all 4 frames.
- **Packages:** bees were removed from colonies in April to leave each parent colony at pollinating strength. From 1-1/3 to 2 lbs. of bees were removed from every colony that packages were taken from.

During the study, all 60 colonies were measured for net wt. (gross wt. — empty equipment wt.), total sealed brood, and surplus honey production. Although these were taken all summer, only the final outcome will be discussed here.

So, already stated, prices have been adjusted for U.S. dollars. Our figures are as follows:

Honey — $.60 per pound (Source: Bee Culture Honey Marketing Report, Feb. 1988)
Pollination Fee — $23.00/colony/crop (Source: same)
4 Frame Nucs with Queen — $20.00 (net) (Source: Average advertised price from Feb. 1988)
2 lb. Package with Queen — $12.50 (net) (Source: same)

INCOME RESULTS OF CANADA STUDY

	Honey Production Only	Honey Production and Pollination	Honey Production, Pollination and 1 Package	Honey Production and 1 Package	Honey Production and 1 Nuc	Honey Production, Pollination and 1 Nuc
Honey	$34.80 (58#)	$18.00 (30#)	$33.00 (55#)	$39.60 (66#)	$33.00 (55#)	$33.60 (56#)
Package	--	--	$12.50	$12.50	--	--
Nuc	--	--	--	--	$20.00	$20.00
Pollination	--	$46.00 (2 crops; $23/crop)	$46.00	--	--	$46.00
Total	**$34.80**	**$64.00**	**$91.50**	**$52.10**	**$53.00**	**$99.60**

As you would imagine, the more intensively you manage your colonies, the more you will get out of them.

Honey production, surprisingly, was essentially constant for every activity except one, which was far lower than the rest. It appears that the stress of moving for pollination, without removing nucs or packages was detrimental to honey production.

The most amazing piece of information to come out of this is the result of removing a package or nuc. This additional stress, with or without pollination, appears to have stimulated these colonies to increase honey production — a fact you should not overlook.

In fact, if you normally raise honey and pollinate a crop or two, you are missing the added income of selling a package or nuc *without hurting either honey production or pollination activities!*

As further incentive, if you think you need one, at the end of the study, the researchers measured colony strength, both in net weight (gross wt. — wt. of empty equipment) and total sealed brood. There was no significant differences in any of the colonies regarding net weight. However, there were differences in the amount of sealed brood. In every case, those colonies used for pollination had more sealed brood than their counterparts. The author's of the study suggest that moving colonies for pollination may have actually stimulated brood rearing.

They present further information in the form of ranking each of these treatments. For a 'biological' score (net wt. and brood), the colonies used for pollination consistently ranked higher than colonies not used. For an 'economic' score (honey production and gross profit/colony), colonies used for pollination *and* nuc or package production consistently outscored all other treatments.

This study has shown that under similar conditions, colonies used for *both* bee production and pollination will produce as much honey (if not more) as colonies used only for honey. Further, by taking this information, and using your own figures (honey production/colony + sales of nucs or packages + pollination fees) you can predict your gross annual income/colony.

Pollination can be profitable, and coupled with other management techniques can significantly add to your bottom line this year.Δ

**Honey Bee Colony Characteristics and Profitability of Pollination Management Systems.* Scott, Cynthia D., M. L. Winston. Journal of Apicultural Research. 24(1):43-48 (1985).

Winter Preparations.

Beekeeping At Miner Institute

LORETTA SURPRENANT
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Chazy, New York 12921

Being a woman in a man's world isn't easy. But being a woman beekeeper is even more challenging. Nine years ago I was employed by the W. H. Miner Agricultural Research Institute., a non-profit organization offering specialized undergraduate programs in environmental science, in-vitro cell biology and farm management. I was hired as a secretary, but if you're wondering how a secretary ever became a beekeeper, read on.

When I started, my boss had a bee project at the Institute and he consented to let me help him with the project. I knew absolutely nothing about bees, but the more I worked with them, the more I realized I really enjoyed learning about them. After a time, he left the Institute and no one else had any interest in the program. I've always been an ambitious person and I'm always looking for a challenge. I got the bright idea that perhaps they would consider me taking on the project.

To my amazement my superiors said that I could coordinate the program. And besides, no one else wanted to be involved in it. This was the beginning of a very challenging and rewarding experience. Remember, the only experience I had working with bees were the few times I ventured out with my former boss.

To get practical experience, I wrote to Dr. Morse at Cornell University, asking if I could take their correspondence course. Then, I attended the EAS Short Course in Vermont. I have since attended a number of other EAS Short Courses. I also called Dr. Clarence Collison from Pennsylvania State University and asked if he would send me his lectures and exams that he gave to his students at Penn State. With the help of these people, things started to take hold.

I became responsible for the bee project in 1980, when the program consisted of a one day seminar, but somehow that was not enough for me. At the first seminar, I noticed that there was a lot of interest in the Chazy area about bees. The idea hit me that perhaps we should establish an organization. The Champlain Valley Beekeepers' Association was formed in 1981 and continues strong today.

Typical demonstration at April's Beekeeping Seminar.

After the formation of the Bee Association, I again called Dr. Morse and asked if he would be interested in doing a Short Course at the Institute. Previously, they had the Short Course in Ithaca. He graciously consented to having it that year at Miner Institute instead of Cornell. Attendance was great!

Working with the Association, we were able to have many special programs throughout the year. Things seemed to be going very well with the project but I still needed more of a challenge. That's when I journeyed to the Southern States Beekeeping Federation meeting in Williamsburg, Virginia. It was there that I decided to bring their "Let's Buzz the School's" program back to Miner Institute where it was adopted and revised. "Let's Buzz the Schools" is offered to schools through the Institute's Continuing Education Program and is geared for grades K through 5. We have

successfully adopted this program and have put it together in booklet form. It has been requested by many states and foreign countries.

By working with school children, I began to realize how much I enjoy this type of work. There have been many opportunities at the Institute to work with students of all ages. In the past, I have worked with elementary children, but now, through the Summer Experience in Farm Management Program, college juniors and seniors

Lorretta Surprenant at her post.

have an opportunity to get first-hand experience working on our farm with both the dairy herd and field crops. The Institute has made me a regular part of that curriculum, and I lecture on bees not only to the Summer Experience students, but also students enrolled at Plattsburgh State.

I have also had the good fortune of being elected secretary of the Eastern Apicultural Society, an organization primarily for hobby beekeepers with approximately 1600 members.

Beekeeping for me is perhaps a bit different from other women beekeepers. I not only have the opportunity to manage bees, but I have Miner Institute's outreach program to work with, which has become the most satisfying and rewarding experience of my life.

As you can see, being a woman in a man's world has not set any limits. I feel that if you have the desire and the ambition the world can be yours. All a person needs is for someone to believe in them and you'll succeed!Δ

William H. Miner, Founder.

What Is Miner Institute?

William Henry Miner was an industrialist and philanthropist who had a dramatic impact on the North Country. Born in Juneau, WI in 1862, he lost both of his parents at the age of 7. After their death he made his home with his aunt and uncle in Chazy, New York on the homestead farm that belonged to his grandfather. As a child he attended a one room schoolhouse and worked on the farm. At the age of eighteen, he left Chazy and journeyed to his sister's home in Lafayette, IN where he worked as a railway machine shop apprentice. An ambitious worker, he advanced to draftsman, estimator, assistant superintendent and manager, while attending business college at night, and later attending the University of Minnesota.

Shortly, he was offered a position with the Hutchins Refrigerator Car Co., as mechanical superintendent in charge of operation and maintenance of equipment. This was at a time when the company was having gear failure on it's cars and was faced with heavy damage claims for fruit and vegetable spoilage. Miner focused on the development of a more effective shock absorber and in 1891 was granted a patent on a spring draft rigging, doubling the protection of the shock absorbers available at the time. The success of this device enabled him to start his own company. By 1898 the Miner tandem draft rigging was in use on 15,000 cars owned by 16 railroads and private car lines.

As the railroad industry grew, producing heavier railway cars, Miner improved his design in 1904 with a friction draft gear, meeting the requirements of heavier freight cars and locomotives. His company also produced power hand brakes, roller side bearings, and safety and locking pins.

Mr. Miner used his increased wealth for the general good of his fellow man. He constructed the Chazy Central Rural School in Chazy to give children some of the advantages and opportunities which he did not have. He also built and completely equipped the Physicians Hospital in Plattsburgh and restored the Alice T. Miner Colonial Collection and the Kent-DeLord House, historic homes of early American days.

During his youth on the farm, he learned to appreciate and love the rigid discipline of farm life. So in 1903 he undertook the development of Heart's Delight Farm in Chazy, on the original 144 acres left by his aunt and uncle, by expanding the estate to over 15,000 acres. Heart's Delight Farm carried out a number of projects — raising prize-winning livestock; planting and harvesting crops; honey and maple syrup production; and the erection of a series of dams and power plants enabling the farm to become the first in New York State to use electric power.

Mr. Miner passed away in 1930, but in his will he provided a system of funding that enabled the Trustees to develop his facility into a center for agricultural education and research. In 1956 the William H. Miner Agricultural Research Institute was created on the site of Mr. Miner's Heart's Delight Farm in Chazy, NY.

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Beekeeping Perplexities

STEVE TABER of Honey Bee Genetics • P. O. Box 1672 • Vacaville, CA 95688

"Bee Havers — Beware!"

A recent article by Dr. Larry Connor in the *Speedy Bee* (Dec. 1987) was right on the mark when he suggested that the biggest problem facing beekeeping is the hoard of beekeepers who are uninformed about the bees they keep. They do not attend meetings, nor do they read books or magazines about bees. Many of them have their bees in an out-of-the-way place so that even county inspectors don't know of their existence. Why, all of a sudden, is being an isolated and ignorant beekeeper so bad?

We have been confronted in the last several years with four, that's right, FOUR new bee diseases that I did not have to contend with fifteen years ago. Then, it was American foul brood, European foul brood, and nosema. Occasionally, a colony would come down with something else, but nothing that would devastate an entire yard of colonies. Now, we have chalkbrood and the two mites, the internal mite and varroa. Plus the last disease, which isn't here yet and is not really a disease, but let's call it one anyway — the impending arrival of the Africanized honey bee (AHB) from Mexico. Let's concentrate on varroa, which can kill colonies in three to five years (if not sooner) after initial infestation, and the AHB's supposed stinging problems with non-beekeepers.

Unfortunately, no one has any firsthand experience here in North America with either one of these problems. (Yes, I know quite a few people have worked with the AHB in Venezuela, Brazil, Costa Rica and Panama, but none of them have worked with it here in the USA.) And, what you need to keep reminding yourself is that the same bees behave differently in Northern California, Louisiana, Wisconsin, New York or South Carolina. Oops, I left out Ohio and Arizona. Those states are all the places where I have worked with bees.

Right now, our best guess is that varroa will be more of a problem in the southern tier of states than in the more northern ones, because brood is reared over a longer period of time. At least in Northern Europe, Professor Roger Morse reports that varroa is not as great a problem as it is in Southern Europe. And, I agree with him when he says that all states are probably infested with varroa, not just the dozen or so where it has been found. To treat bees for varroa, it is strongly suggested by our European friends, that all beekeepers in an area treat their colonies in unison, at the same time. They suggest that the colonies should be treated in the fall, about the time when brood rearing is over, or almost over.

I don't agree with many of the predictions on the effects the coming AHB will have on non-beekeepers, pollinators and honey producers. My opinion is we will have few problems, and none that *good* beekeepers can't handle, providing there is not interference from regulators. Right now my opinion is unimportant; what we all agree on is that when you have temperamental bees in your apiaries, you find and remove the queen and replace her with one reared from gentle stock.

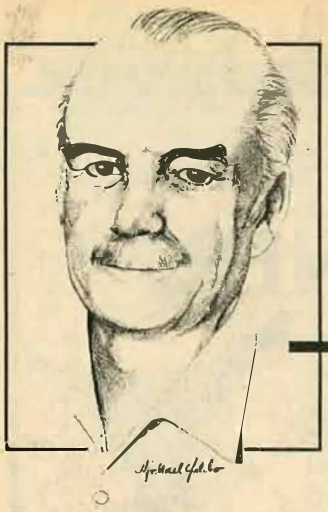
So, we come back to those "pecker wood beekeepers" who know nothing and do nothing. They will not be out there treating their bees or requeening mean colonies. They will be a source of constant reinfestation until their colonies are killed off. Then, they will get some more bees and put us under more stress. When I was in North Carolina and Ohio, they told me there were thousands of beekeepers in each of those states; but, when I was talking to their state bee meetings there were not much over a hundred people there. Of course, I can hear it now — it was because I was on the program that few people came!

However, this is not the only group that is going to give us trouble. I have met a number of commercial beekeepers who have learned beekeeping by working with and for another commercial beekeeper and subsequently going into business for themselves. They have never read a bee magazine, never attended a bee meeting or don't know any of the current problems until informed by the county inspector. I was told of an obstreperous beekeeper in West Germany who refused to treat his bees for varroa control, *and he was thrown in jail.* Yes sir; I agree, that's pretty drastic treatment.

That means all of us, each and every one of us, must get out and beat the bushes, rounding up all those "pecker wood bee havers" and convince them to come to county and state bee meetings. And, convince them they should buy a subscription to a bee magazine (see Mr. Editor, I am trying to help your journal's circulation).

There is some light at the end of this tunnel, or at least I think so; and, a few people agree with me. And this is increased awareness of solving many of our problems by using artificial insemination and knowing honey bee genetics.

In the last few years there have been several books released devoted to breeding bees, including one by me. The University of California, Davis, has just created a position for a bee geneticist. For years people in plant and animal sciences have been solving many of their disease problems by controlled breeding programs, just as we could and should. But, that is not going to solve the basic problem of the ignorant bee haver, who refuses to become informed about what is going on. I would be pleased to hear from any of you who think you can solve this problem.Δ



THE BEE SPECIALIST

ELBERT R. JAYCOX • 5775 Jornada Road North • Las Cruces, NM 88001

"Considerations in Buying Packaged Bees!'

When buying package bees, your primary consideration is the quality of the queen in the package and how to get her safely established in the colony so that she will head the colony for the entire season, or at least through the main nectar flow. Of course, you also want a full measure of young worker bees and as few dead bees as possible, but basically the queen is the greatest concern.

Queens in packages are confined in small cages to protect them initially from the strange, or foreign, bees they are being shipped with, and to make it safer and easier for the person who installs them at the end of their trip. In some cases, the queens are accompanied by attendant workers in the small cage; it other cases, the queen travels alone in her cage. Should you be concerned about whether your queens have attendants or not? Probably not, according to a study reported by S. C. Jay in 1967. Jay compared the losses of queens in duplicated shipments of package bees from the United States to Canada. Half the queens had attendants while the others did not.

As Jay pointed out, we usually remove attendant bees when we introduce queens to established colonies. When queens in packages are hived, the queen's relationship with the bees could be somewhat different between solitary queens and those accompanied by attendants. You can minimize this difference, and the bees' response, by releasing all queens at the time the packages are hived, as the beekeepers did in Jay's experiment. As a result, he found no significant difference in queen losses between queens alone in a cage or with attendants. The first year of the two-year experiment, queen losses were 5% in each group. The next year it rose to 8% for reasons unknown. Had the queens been left in their cages for introduction, differences probably would have been evident in favor of the queens without attendants.

Queens caged alone for shipment in packages of bees. Queenless holding colony is beneath the frame of cages.

Should you be concerned when buying packages whether the queens have been held in their cages for some length of time before being shipped? This is a common practice when the supply of bees for packages is not in balance with the number of queens available. The queens can be held either with or without attendants as long as those alone are within a strong, well-fed, queenless colony or portion of a queenright colony to which the queen does not have access. Queens in cages with attendants should be given water. To avoid any detrimental effects on the queen, the cages should have screens of large mesh so the workers can contact the queen to feed her. Later, in the packages, a large mesh, with openings at least 2 x 2 mm, is beneficial also. Eight-mesh hardware cloth has openings of about 3mm square. Fewer queens will die in storage and in packages with the larger openings — window screening is too fine.

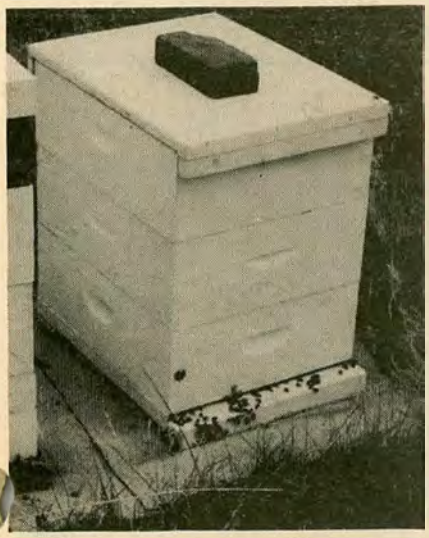
With good storage conditions, queens with attendants can be held at least two weeks without harmful effects. The queens alone in cages with proper screens can be held as long as two months without problems according to a recent thesis study by Luis Matamoros in Costa Rica. He found that the queens performed well when introduced to a colony after confinement for that period.

There is always a chance that queens may be injured while being held in a cage. Z. Jasinski reported at the International Beekeeping Congress in Poland on observations made of such injuries. They were common on virgin queens — 60% were injured, mostly on their feet and legs, but sometimes on antennae and wings as well. More queens were injured when they were held grouped in cages in one queenless colony. It is always a good idea to have some queen-cage candy available in cages for solitary queens and the cage needs an area into which the queen can retreat from the surrounding workers. I do not know of any observations on injuries to queens in packages, but they undoubtedly occur and could be one cause of supersedure in package colonies.

Finding Queens in All-Shallow Hives

When I wrote that it was more work to find queens when the colonies are housed in hives of 6-5/8 inch bodies, Mrs. Mildred Hathaway of Sutton's Bay, Michigan, disagreed. She and her husband manage 300 colonies, all of which have three, 6-5/8 boxes for a brood chamber. When it comes time to make a split from such a hive, Mrs. Hathaway separates the three boxes, putting the top two on extra bottom boards and giving them all a screened inner cover. Other openings are screened as well. After a half-

hour or more, she returns, placing a caged new queen on top of each hive body. She can then tell by the reaction of the bees, eager or combative, in which box the original queen is located. This cuts her work by two-thirds. She has only to look through one hive body to find the queen and then to make sure that she is in the original bottom box before taking the queenless portion to make new colonies.



Hives with three 6-5/8 inch hive bodies as brood chambers. Can they make your beekeeping easier?

Mrs. Hathaway highly recommends using only 6-5/8 inch hive bodies for both brood chambers and supers. By coincidence, I got another endorsement for all-shallow colonies on a visit to California in January. Bill Huston, longtime commercial beekeeper there, said that if he were back in the beekeeping game nowadays, he would use only 6-5/8 inch bodies.

Foraging Distances and Weather

When you have a choice of locations for your bees to visit a particular crop, always keep in mind the value of having the bees as close as possible, especially in the spring or at any time when the weather may interfere with flight. Theo Gibb confirmed this idea from his observations on honey bees visiting oilseed rape fields in England. The Newcastle & District Beekeepers' Association had scheduled a meeting billed optimistically as "The Rape Harvest". It was a cool day, maximum of 52°F (11°C) with clouds and a light breeze. The bees visited the blooming rape, about 550 yards away, until about 3:15 p.m. when they quit flying. There was no honey to harvest.

Gibb visited two other apiaries on his way home. Bees at both locations were still flying strongly well after 5 o'clock, collecting nectar and pollen from the rape blossoms. The weather had not changed, but the apiaries were located *within* the fields of oilseed rape where the flowers ". . . were within 'walking distance' of the hive entrances". That distance can make the difference between a good crop and a poor one from spring nectar sources.

Ronald Ribbands studied foraging and the weather back in the 50's in England on apples, basswood, and heather. He put colonies of bees beside the crop plants and others at about one-third and two-thirds of a mile from them. Those colonies farthest from the sources of nectar produced one-third less honey than the others. The difference would probably have been greater in years with poorer weather.

Although the weather is the biggest factor, the flying time to a more distant crop is a factor in reducing the nectar yield. The bees will also work a longer day when the crop is close to their hive.

Low temperatures in spring are a factor also in fruit pollination because pollen grains must have a minimum temperature to germinate and grow down the flower's style to effect fertilization. Bill Howell of Prosser, WA, found that sweet cherry pollen would grow at 39°F. He suggests that we must develop or find strains of honey bees that will visit cherry blossoms in years with poor pollination weather and cool temperatures. That ability would be of value in foraging on oilseed rape as well. Theo Gibb found plenty of nectar and pollen in those plants in England but without sufficient bees to harvest them in the cool weather. Gibb's story was printed in the newsletter of the Newcastle & District Beekeepers' Association.Δ

The Other 'Down Under'

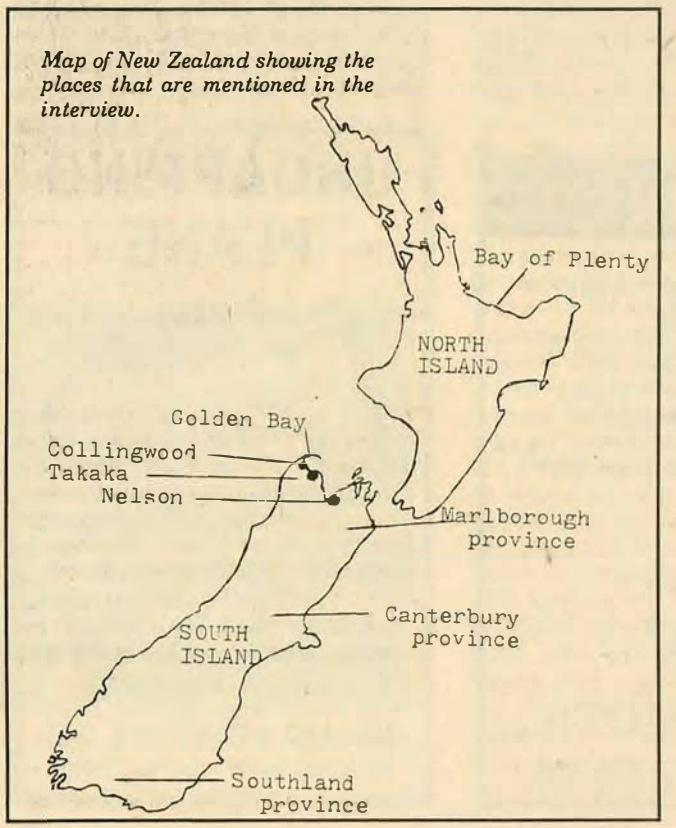
BERYL STRINGER • 19919 Summit St., Blodgett, OR 97326

An Interview with Gavin White, Takaka, New Zealand

Gavin White is a honey producer and queen breeder on South Island, NZ. This month, we'll take a quick look at his operation, including production, equipment, pollination and queen rearing. Next month, we will take an indepth look at his honey production and some local pests.

Gavin White, owner of Golden Bay Apiaries, holding bar from baby nuc.

While in New Zealand in May, 1987, I visited Gavin White, owner of Golden Bay Apiaries and vice-president of the New Zealand Beekeepers Association. Mr. White runs a diversified operation: he produces queen cells, laying queens for domestic and export sale, dark "bush" honey in comb, extracted and creamed forms, and also fulfills pollination contracts. Originally from Canterbury, he is now living in the relatively isolated Takaka area and makes interesting comparisons between his present and former locations.



Map of New Zealand showing the places that are mentioned in the interview.

"We're doing about five different things, not just a single product, which is why we've survived where others have gone to the wall," says Mr. White. "I'm not a full-time queen breeder — I'd be bored to death. We spend roughly two days a week on queen rearing and the rest is split up."

"Here in Takaka we have several disadvantages in that we produce darker honeys, our climate is a lot wetter, and we are further away from freight depots. But we have a lifestyle in a beautiful area, so it is a small price to pay."

"We produce between three and four thousand queens a year, and that's all I intend to do. We could double or triple production if we wanted, but what's the point? We work seven days a week now, so why make it worse? We'd have to employ more people and that would just take the icing off the cake."

"I worked for Homer Parks for a while on my way up to Alberta to work the 1970 season for his nephew. It was really because of Homer that I changed the direction I was going in

One of Mr. White's double nucs; plastic innnerflap, queen cup visible near the middle of the box, feeder at outside edge of box.

beekeeping. I was always going to go into commercial honey production, but I changed my attitude and went for the queens as well."

EQUIPMENT

"We make all of our equipment. I usually have someone working for me full-time through the year and we've got to have work for him. Each year we make up about 100 boxes and frames just for replacements; it's a never-ending job. The wood we use is Radiata pine (Monterrey Pine) because it's very versatile, light and strong. We dip all our boxes in a copper-based wood preservative, then give them a couple of coats of acrylic plastic paint. In our 80" rainfall area, an untreated box will only last about four years, but a treated box might last 20 or 30 years."

"Paint is mainly cosmetic. People buy with their eyes and I like to think that when I sell out I have a reasonably good-looking outfit. It's a lot of extra work at the time to do things right, and it's expensive, too. For a time it cost us 60¢ (US36¢) in paint alone per box, not counting labor."

"We get our foundation from a manufacturer down south who makes most of the foundation in New Zealand. We send our darker wax there and get it converted over. We sell our cappings wax, which mainly goes for export to Iran, the UK, and other places. The price is down at the moment, so we're just sitting on it."

POLLINATION

"We don't do a lot of pollination, only a couple of hundred hives. We do the pollination of our own kiwifruit and, as chairman for our packing company, I supply the bees for the members in that. I used to go over the (Takaka) Hill when I first started out about 10 years ago and I needed the money, and it was terrible. Steep, narrow, winding roads, hand-loading on my own and all. I just hate shifting hives!"

"For kiwifruit, the Nelson Beekeepers Association drew up a contract to ensure everyone has the same high standard of hives. You have to be a member of the N.B.A. to use the contract, which is one way of keeping people together. We now have an agreed standard of hive strength and we actually do an audit among our members to make sure they do what they say they're doing. This gives the grower peace of mind because he's getting value for his money. We have the price up from $30-40 to $85 (US$51) a hive because of the assured colony strength."

Frame from nuc with emerged queen cell; queen cup still attached.

QUEEN REARING

"We graft into plastic cell cups which are unique to New Zealand and Australia. We use them over and over again and we haven't a lot of time used up in winter dipping wax cups. The cups fit onto dowel bases on a bar, with four bars in a frame. If you have a few misses on the cells, you can bunch up the cups to fill the gaps and make up your numbers. There's sometimes a little difficulty when you first use the cups, but when they've been used once and have a wax ring around them, there's no problem."

"A disadvantage is that you can spread disease with the cups. I wash mine in disinfectant every now and again. At the moment, the cups are about 15¢ each and they last two or three years, so they are cheap considering the price of a queen."

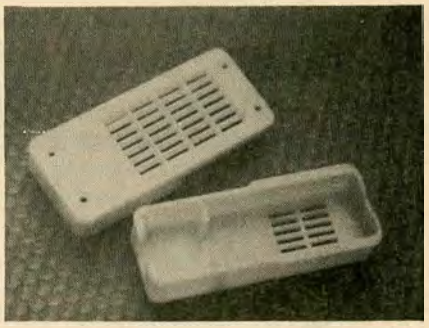
"We clean the old cocoon out with a blunt screwdriver, then put bars of the cups in a starter hive for an hour or two, then graft straight into them without priming."

"Our starter hives are two deep brood boxes with a queen excluder between them. The laying queen is in the bottom box, and the cells are put in the second box. I graft every second day and have cells coming on every second day. It is not very sophisticated, but using just 14 hives, I produce about ten thousand cells. So you don't need a lot of hives to produce a lot of cells."

"In our finishing hives, we actually have three lots of finishing cells, all at different stages. So the bees are only really working on the frame of new cells that have just been put in. The others have finished feeding and it's only a matter of time and sealing. After they're sealed, we move them to two incubator hives, to keep the system going. It's surprising how many cells you can get out of it."

"We make two-day queen cells by grafting larvae into cups and putting them in a starter colony for one day. On the second day, the cell is removed and placed in the colony to be requeened. The old queen can either be killed or caged and left in the hive. If the cell happens to miss for any reason, the old queen can be released again. We've been actually killing the old queen and our acceptance rate has been 80 to 85%. The idea is that one hive spends all its energy feeding one queen cell and therefore you end up with a large and perfect cell."

"I've been reluctant to use this method in the spring because it takes the laying queen out of action for so long. By the time the bees finish the cell and the queen emerges and mates, you've got too great a time when the hive's got nothing laying. However, in the autumn, it's actually an advantage because you want that queen to stop laying. It is a very cheap form of requeening and it works reasonably well."



Plastic queen cage, separated to show compartment for candy. Tab at end of the lid is removed to allow small holes in the lid fit four 'legs' in the bottom of the cages, so cages can be stacked with room for air circulation.

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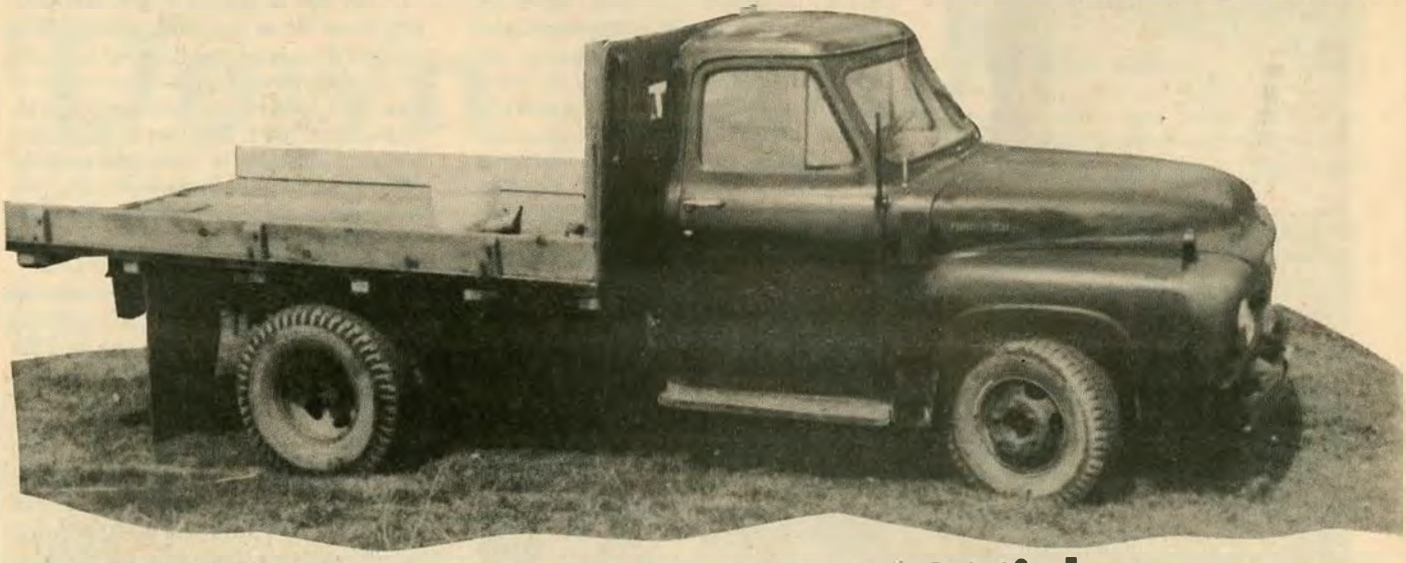
POLLINATION TIME



With Buzz Riopelle

This month we're going to follow Buzz Riopelle while he prepares a group of colonies for a pollination trip.

Buzz uses 30-40 of his 150 or so colonies each year for pollinating 3 area apple orchards. He charges $23.00 per colony for his service. He doesn't have a written contract with any of the orchard owners. In fact, for two of his orchards the only time he even sees the owners during the year is on delivery and pickup.

"A handshake and a telephone call are all I've ever needed," he says.

He does get assistance from the orchard employees on occasion though, especially when there is a tight schedule to follow.

"They will help load and unload in a pinch, especially when spraying is involved," he says, and goes on, "But I usually have my own help, one other person, if I can schedule it."

"With only a 12 hour notice I can't always get help, even my wife, so rather than go without bees, or spray them, the orchard people are real helpful."

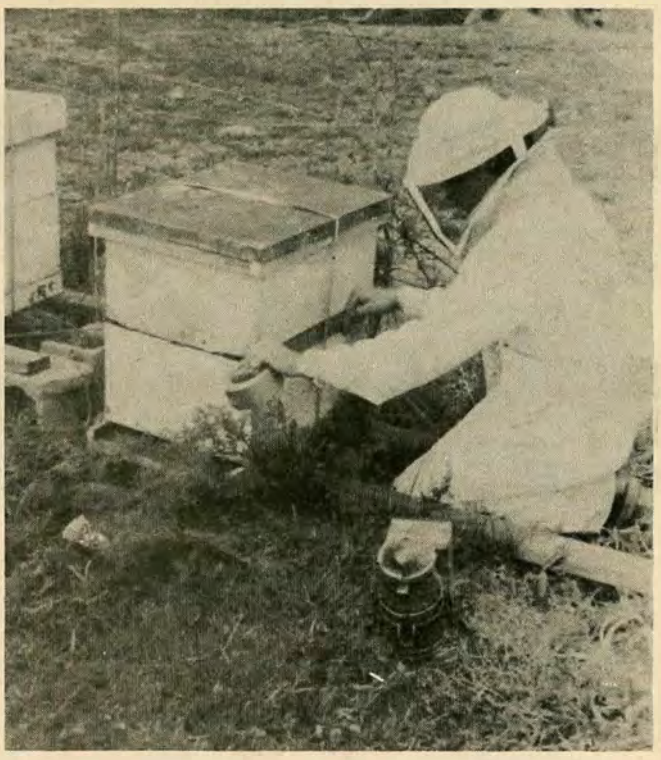
Because of this good relationship with his customers, Buzz doesn't have problems with sprays, but the time constraints needed to clear an orchard can put pressure on moving them.

Pollination fees don't play a big role in his annual income, but, as he says, "Every little bit helps, and it rounds out my income during a slow time of the year."

"If you've got the equipment, and the time, pollination can be a big boost to any beekeeping operation," says Buzz, and with his setup, it is easy to see that it works.Δ

After a quick inspection, to make sure everything is in order, and that the colony is up to pollination strength, Buzz aligns the supers, cover and bottom board for banding.

Buzz uses plastic banding to keep the colonies together. It doesn't stretch, so it can be tightened enough to be secure. The band is tightened using a commercially available fastener. He buys banding in 5000' rolls for economy.



After the banding is applied, all the extra openings are sealed with duct tape. This keeps curious bees from leaving the colony during shipment.

A securely banded and taped colony, almost ready for moving. Buzz moves colonies only at night after the field bees have returned for the day, and because it is cooler. He seals the front entrance with a rag, thus restricting ventilation, but feels it is safer than screening them. "By moving at night, and quickly, I've never had a problem this way," he says.

Howard Weaver & Sons Apiaries

Texas has the reputation for things being big. But it also has the honor of producing things good, and Howard Weaver and Sons Apiaries is one of the good things in Texas. And, good and big can go hand in hand, when you take a good look at this queen, package and honey operation.

The Weaver family is celebrating their 100th Anniversary in the bee business in 1988, and, as Morris Weaver, proprietor says, "You don't stay in business for 100 years without a quality product and faithful, long-term employees who care about what we do."

This month we'll take a look at the queen production part of this operation. Overall, queen sales account for about 40% of their business, with packages running about 20% and honey production another 40%.

Howard Weaver and Sons has 6 full time employees and seasonally may have as many as 15 people working to provide the service they feel is the most important aspect of this outfit.

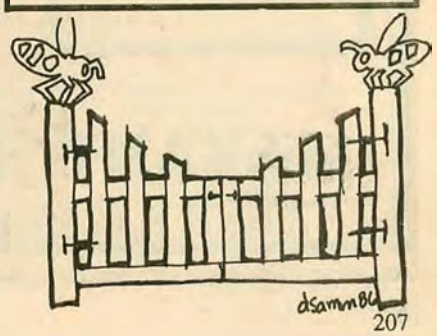
Basically, the queen production schedule followed goes like this, depending on the weather and some other factors.

In March, the queen production nucs are stocked with 1 comb of honey, one comb of foundation and bees from the package production part of the business. These baby nucs are given a boardman feeder, and a ripe queen cell which has been 'candled' to make sure it is viable.

Each nuc is worked on a 12-14 day schedule. Four to five days after the

Continued on Next Page

Morris Weaver, proprietor of Howard Weaver and Sons, with 11,401 queens ready for shipment.



A baby nuc being stocked with bees and brood.

queen cell is placed the nuc is checked for an emerged virgin queen.

Once a virgin is observed, the nuc is confined for 48 hours, then opened in the evening for a few days of mating flights.

After 14 days from hatching, the nuc is again checked to observe the laying pattern of the queen. If all is in order, the queen is caged and ready for shipment.

Morris says this is where good employees are invaluable. "Without experience, you just can't tell if a queen is of the quality we want", he says.

"Size, pattern, and a 'feel' for a good queen are all important, and that comes with experience, training and dedication to quality", he says. "We have a few people who can spot a bad queen in a minute, and that queen is gone, it never gets to a customer."

When a queen is removed from a nuc, the nuc is given more feed, and the next day another cell is added. The process starts all over again, and goes strong from March through June first, but continues to some degree through October. "Fall requeening is gaining in popularity", says Morris, "and we are ready to supply those that want fall queens."

Next month, we'll take a look at Howard Weaver and Sons package production.Δ

Feeding the baby nucs.

Ripe queen cells, ready to place in nucs.

1988 - Who's Who in Apiculture

To supply a handy reference of the names and addresses of State and Provincial Apiary Inspectors, Secretaries of Beekeepers' Associations, Extension Workers in beekeeping, and other information often needed by our readers and Industry Leaders, we have amended our Who's Who in Apiculture, effective April 1, 1988.

State or Province	Bees on Combs Admitted	Apiary Register. Required	Fee	Secretary — State Association Address & Phone Number
AL*	Not Allowed	Yes	Yes	Mrs. R. V. Harrell, Hayneville, 36040
AK	None	No	No	Fletcher Miller, Box 140173, Anchorage, 99508, Ph. (907) 338-4694
Alt.*	Not Allowed	Yes	No	Louise Zwaenepoel, #24, 7215-147 Ave., Edmonton, T5C 2T1
AZ	Cer. & Per.	Yes	No	Barbara Stockwell, Box 368, Arivaca, 85601, Ph. 398-2366
AR*	Cer. & Per.	Yes	No	Darrel Jester, Rt. 1, Box 489, Osceola, 72370
B.C.*	Not Allowed	Yes	No	Richard Springborn, Box 186, Vernon VIT 6M2, Ph. (604) 542-2903
CA*	Certificate	Yes	No	Carol Penner, 19980 Pine Creek Road, Red Bluff, 96080
CO*	Cer. & Per.	Yes	Yes	Mrs. Tom Jones, 605 No. Columbus, Yuma, 80559
CT*	Cer. & Per.	No	Yes	Isabelle Muzekevik, 226 Charter Oak St., Manchester, 06040, Ph. (203) 649-1746
DE*	Cer. & Per.	Yes	No	Connie Groll, R. D. #1, Box 132D, Lewes, 19958
FL*	Cer. & Per.	No	No	Phyllis M. Wicks, 8535 Killian Drive, Kendall, 33156, (305) 274-0127
GA*	Pending	Yes	No	Cecil T. Sheppard, 4054 Briarglade Way, Doraville, 30340-5112, (404) 491-3734
HI*	Not Allowed	No	No	Lee Qng Chun, 2115 N. School St., Honolulu, 96819, (808) 841-6440
IA*	Cer. & Per.	Yes	No	Dan Sowers, Rt. #2, Maxwell, 50161, Ph. (515) 387-8814
ID	Certificate	Yes	Yes	Jim Ellis, 3615 W. Idaho Blvd., Emmett, 83617
IL*	Cer. & Per.	Yes	No	Rita Taylor, Rt. 2, Box 249, Pleasant Plains, 62677, Ph. (217) 626-1319
IN*	Cer. & Per.	Yes	No	Claude F. Wade, Room 613, St. Of. Bldg., Indianapolis, 46204, Ph. (317) 232-4120
KS*	Cer. & Per.	Opt.	Yes	Duane Levin, Box 10, Stuttgart, 67670-0010, (913) 543-6210
KY*	Cer. & Per.	Yes	Yes	Pat Norman, 4825 Preston Dr., Louisville, 40213
LA*	Not Allowed	Yes	Yes	Patricia Harper, Rt. 1, Box 197, Carencro, 70520.
Man.*	Not Allowed	No	No	Don Dixon, 911 Norquay Bldg., Winnipeg R3C OP8, (204) 945-3861
ME*	None	Yes	Yes	Beth Pritchard, RD #1, Readfield, 04355
MD*	Permit	Yes	No	John Romanik, 3200 Pine Orchard Lane, Ellicot Cit, 21043
MA	Cer. & Per.	Pend.	Pend.	Ellis B. Hayden, Jr., 62 Main St., Norfolk, 02056, (617) 528-5362
MI*	Cer. & Per.	Yes	Yes	Millie Hathaway, P. O. Box 333, Suttons Bay, 49682, (616) 271-3192
MN*	Cer. & Per.	Yes	Yes	Darell Rufer, Rt. 1, Box 408R, Waverly, 55390, (612) 658-4645
MS*	Pending	Yes	No	Harry R. Fulton, P. O. Box 5207, Mississippi State, 39762, (601) 325-3390
MO	Cer. & Per.	No	No	Jim Thaxter, Rt. 4, Box 60E, Moberly, 65270, (816) 263-2694
MT	Cer. & Per.	Yes	Yes	Marjorie M. Barnes, 24 N. Walnut St., Dillon, 59725, (406) 683-4973
NE*	Cer. & Per.	Yes	No	Sally Leu, Rt. 4, Box 194, Norfolk, 68701, (402) 371-0636
NV*	Permit	Yes	Yes	Bill Goff, 14060 Edmands Dr., Reno, 89511, (702) 851-1888
N.B.	Not Allowed	Yes	No	Fred B. Ervine, Site 3, Box 13, R. R. #9, Fredericton, NB, E3B 4X9
NH*	Certificate	No	No	Franics W. Dodge, P. O. Box 91, Goffstown, 03045, Ph. 497-4507
NJ*	Certificate	No	No	Gary L. Bradshaw, R. D. #2, Box 281, Stockton, 08559, Ph. (201) 996-6331
NM	Certificate	Yes	Yes	Mrs. Betty J. Cole, 600 N. Bosque Loop, Bosque Farms, 87068, Ph. (505) 869-2841
NY*	Certificate	Yes	No	Judith A. Doan, 1263 Redman Rd., Hamlin, 14464, (716) 964-3121
NC*	Cer. & Per.	No	No	Dorothy Humble, Rt. 3, Box 160, Liberty, 27298
ND*	Cer. & Per.	Yes	Yes	Mike Stewart, R. R. 1, Box 87C, Rolette, Ph. (701) 245-3741
N.S.*	Not Allowed	No	Yes	Earl Blades, P. O. Box 550, Truro, B2N 5E3, (906) 895-1571
OH*	Cer. & Per.	Yes	Yes	Glenn Rader, Walnut Street, Pandora, 45877, Ph. (419) 384-3051
OK*	Cer. & Per.	Yes	Yes	M. J. Bragg, Rt. 1, Box 105, Boswell, 74727, Ph. (405) 566-2504
Ont.*	None	Yes	No	Patricia Westlake, RR #3, Bayfield, Ont. NOM 1G0, (519) 565-5261
OR*	Certificate	Yes	Yes	Bill Rufener, Rt. 2, Box 157, Banks, Ph. 324-2571
PA*	Cer. & Per.	No	No	Yvonne Crimbring, R.D. 1, Box 315, Canton, 17724, (717) 673-8201
P.E.I.*	Not Allowed	Yes	No	Steve Wonnocott, Isecond St., Charlestown, P.E.I. CIA IEO
P. Rico	Not Allowed	No	No	Tito Nieves, P. O. Box 471, Lares, 00669
Que.*	Not Allowed	No	No	L. Dion, C.P., 656 St. Hyacinthe, Que.
RI*	Certificate	Yes	No	Elizabeth Latham, Pole 36 Hopkins Ave., Johnston, 02919, (401) 934-1767
Sask.*	Not Allowed	Yes	No	John Gruszka, Box 3003, Prince Albert S6V 6G1, (306) 953-2790
SC	Certificate	No	No	William L. Baker, 2663 Ford St., Sumter, 29150
SD*	Cer. & Per.	Yes	Yes	Gary Schmidt, Star Rt. 2, Box 249, Martin, 57551, (605) 685-6528
TN*	Cer. & Per.	Yes	No	William D. Lane, 5801 Vassar St., Memphis, 38119, (901) 683-7494
TX*	Cer. & Per.	Yes	Yes	Diane Chancey, 401 Cherry Creek, Dayton, 77535, (409) 258-3034
UT	Certificate	Pend.	Yes	Jones Bee Co., 286 Andrew Lane, Murray, 84107
VT*	Limited	Yes	No	Michele Beebe, Box 1395, Montpelier, 05602, Ph. (802) 223-7316
VA*	Cer. & Per.	Yes	No	Maryethel Miller, 28 Teton Dr., Fredericksburg, 22401
WA*	Certificate	Yes	No	Alice Bounds, P. O. Box 602, Toppenish, 98948, (509) 865-2279
WV*	Cer. & Per.	Yes	No	Ruth H. Cahn, High View, 26808, (301) 856-2747
WI*	Cer. & Per.	No	No	Linda Harui, Rt. #2, Box 32, Beloit, 53511, (608) 362-6477
WY*	Certificate	Yes	Yes	Richard Sackett, SR1, Box 39A, Sundance, 82729

*Publish a newsletter sent to State Association Members

State or Province	Professor in Charge of Beekeeping Course (Write: Prof. of Apiculture, c/o State University)	Extension Personnel in Beekeeping (Write: Beekeeping Exten. Spec. c/o State University)	Inspector State of Province (Write: c/o Dept. of Agric.) State Capitol
AL	Dr. James H. Cane	Carl Dennis, Auburn	John Bloch, Montogmery 36193
AK	n/a	Wayne Vandre	John Cramer,Bx 949, Palmer 99645
Alta.	Dennis McKenna	D. MacDonald, Falher TOH 1MO	D. Colter, Falher, TOH 1MO
AZ	Dr. Norbert Kauffeld, Tucson	n/a	R. W. Hancock, Phoenix 85005
AR	n/a	Dr. L. O. Warren, Fayettville	Donald E. Bailey, Little Rock 72205
B.C.	Dr. Mark Winston, Burnaby	Douglas McCutcheon,Surrey	Douglas McCutcheon, Surrey V35 4W7
CA	Dr. Norman Gary, Davis	Dr. Eric C. Mussen, Davis	James Paswater, Sacramento 95814
CO	Dr. Robert Simpson, Ft. Collins	n/a	Leslie A. Zermuehlen, Denver 80203
CT	Prof. A. Avitabile, Waterbury	George Schuessler, New Haven	Robert Purvis, New Haven, 06504
DE	Dr. Dewey Caron, Newark	Dr. Dewey Caron, Newark	Michael Brown, Dover 19901
FL	Dr. M. Tom Sanford, Gainesville	Dr. M. Tom Sanford, Gainesville	Laurence Cutts, Gainesville, 32602 (904) 372-3505, Ext. 128
GA	Dr. Alfred Dietz, Athens	Rodney Coleman, Athens	James P. Harron, Atlanta 30334
HI	n/a	n/a	None
ID	n/a	n/a	Dr. Roger Vaga, Boise 83707
IL	n/a	E. E. Killion, Paris	E. E. Killion, Paris 61944
IN	Bill Fishang, W. Lafayette	Bill Fishang, W. Lafayette	Claude F. Wade, Indianapolis 46204
IA	n/a	Jerry Dewitt	G.L. Stanley, Dept. Ag., Des Moines 50319
KS	n/a	n/a	Gary R. Ross, Topeka 66612, (913) 296-3016
KY	Dr. Glenn Hayes, Richmond	Dr. R. Scheibner, Lexington	n/a
LA	Dr. Anita Collins, Baton Rouge	Dale Pollet, Baton Rouge	Dr. Jimmy Dunkley, B. Rouge 70893
ME	n/a	Anthony Jadczak, Augusta	Anthony Jadczak, Augusta 04333
Man.	Dr. S. C. Jay, Winnipeg	Don Dixon, Winnipeg	Don Dixon, Winnipeg R3C OP8 (204) 945-3861
MD	Dr. Lee Hellman, College Park	Melanie Odlum, College Park	Barton Smith, Jr., Annapolis 21401
MA	Richard Bonney, Amherst	Richard Bonney, Amherst	Alfred R. Carl, Jr., Springfield 01089 (413) 736-2764
MI	Dr. R. Hoopingarner, E. Lansing	Dr. R. Hoopingarner, E. Lansing	John Dreeves, Lansing 48909
MN	Dr. Basil Furgala, St. Paul	Dr. Basil Furgala, St. Paul	Arthur Mason, St. Paul 55107
MS	Harry Fulton, MS State and Dr. James Jarratt, Starkville, MS (short course only)	Harry Fulton, MS State and Dr. James Jarratt, Starkville, MS	Harry R. Fulton, Starkville 39762 (601) 325-3390
MO	Dr. Wayne Atkins, Columbia & Dr. Michael Roling, Springfld.	Dr. Flernoy Jones, Columbia	Joseph Francka, Jefferson City 65102
MT	n/a	n/a	Willard A. Kissinger, Helena 59601 (406) 444-3730
NE	Cliff Walstrom, Lincoln, 68583	Fred Bayendale, Lincoln	Marion D. Ellis, Lincoln 68509
NV	Dr. Harold Arnett, Reno	n/a	John O'Brien, Dept. of Ag., Reno 89510
N.B.	n/a	n/a	Bruce Palmer, Fredericton, Ag. & Rural Devl. (506) 453-3423
NC	Dr. John Ambrose, Raleigh	Dr. John Ambrose, Raleigh	James F. Greene, Raleigh 27611
NH	n/a	S. E. Thewke, Concord 03301	S. E. Thewke, Concord 03301, Ph. 271-2750
NJ	Dr. R. B. Roberts, New Bruns., 08901	Dr. R. B. Roberts, New Bruns., 08901	Jack Matthenius Jr., Phillipsburg, 08865
NM	Dr. Elbert Jaycox, Las Cruces	n/a	Barry Patterson, Las Cruces 88003
NY	Dr. Roger A. Morse, Ithaca	Dr. Roger A. Morse, Ithaca	Robert J. Mungari, Albany
ND	Dean McBride, Fargo 58103	Dr. Dennis Kopp, Fargo	Judy Carlson, Bismarck 58505
N.S.	n/a	Dick Rogers, Truro	Dick Rogers, Truro (906) 895-1571
OH	Dr. Robert Page, Columbus	Dr. James Tew, ATI, Wooster	Gordon Rudloff, Reynoldsburg 43068
OK	Dr. William A. Drew, Stillwater	Darrell Suffridge, Ext. Ctr., Ada	Dr. Steve Kendall, OK City 73105
Ont.	Dr. C. Scott-Dupree, Guelph	Doug McRory, Milton	Doug McRory, Milton L9T 3J7 (416) 878-2314
OR	Dr. D. M. Burgett, Corvallis	Dr. D. M. Burgett, Corvallis	David Turner, Salem 97310
PA	Dr. Robert Berthold, Doylestown	Dr. Clarence Collison, St. College	James Steinhauer, Harrisburg 17120
P. E. I.	n/a	Elaine Clark, Charlottetown	Elaine Clark, Charlottetown C1A 7J8
P. Rico	Dr. M. Moya, Quintana	Jose Munoz, Humacao	n/a
Que.	Dr. J. Louis Villeneuve, Sainte Foy	Dr. J. Louis Villeneuve, Sainte Foy	Dr. J. Louis Villeneuve, Sainte Foy
RI	n/a	n/a	Robert Relli, Providence
Sask.	Dr. S. H. Nelson, Saskatoon	John Gruszka, Prince Albert	John Gruszka, Prince Albert
SC	Dave Alverson, Clemson	J. Howard Jr., Clemson	J. Howard Jr., Clemson 29621
SD	Dr. Robert Walstrom, Brookings	n/a	Bob Reiners, Pierre 57501
TN	Dr. Charles Pless, Knoxville	Harry E. Williams, Knoxville	Thomas Hart, Nashville 37204 (615) 360-0137
TX	Dr. James Smith, College Station	Dr. John Thomas, College Station	Paul Jackson, College Station 77843
UT	Prof. Wm. P. Nye, Logan	Jay B. Karren, Logan	Ed Bianco, Salt Lake 84116
VT	n/a	n/a	Richard Drutchas, Montpelier 05602
VA	Dr. Richard Fell, VPI, Blacksburg	Dr. Richard Fell, Blacksburg	Homer Powers, Richmond 23209
WA	Dr. Carl Johansen, Pullman	Dr. Dan Mayer, Prosser	James C. Bach, Olympia 98504 (206) 872-6005
WV	Dr. James Amrine, Morgantown	n/a	n/a, (304) 348-2212
WI	Dr. Walter Gojmerac, Madison	Dr. Walter Gojmerac, Madison	Marlin Conrad, Madison 53707
WY	n/a	n/a	Walter Patch, Cheyenne 82002

GOVERNMENT AGENCIES

USDA — Agricultural Research Service. National Program Staff, Dr. James E. Wright, Room 225, Bldg. 005, BARC-W, Beltsville, MD 20705. (301) 344-3301.

•**Beneficial Insects Lab.** Dr. John J. Drea, Rm. 100, Bldg. 476, BARC-East, Beltsville, MD 20705. (301) 344-2205.

•**Honeybee Breeding and Genetics & Physiology Research Lab.** Dr. Thomas E. Rinderer, Research Leader, 1157 Ben Hur Rd., Baton Rouge, LA 70820. (504) 766-6064.

•**Agric. Research Service.** Dr. W. T. Wilson, Laboratory Leader, 509 W. 4th St., Weslaco, TX 78596. (512) 968-3159.

•**Bee Biology & Systematics Laboratory.** Dr. John Vandenberg, Laboratory Leader, Utah State University, Logan, Utah 84322-5310.

•**Carl Hayden Bee Research Center.** Dr. Eric H. Erickson, Center Director, 2000 E. Allen Road, Tucson, AZ 85719. (602) 629-6380.

•**AMS - F & V (Agricultural Marketing Service, Fruit & Vegetable).** Ronald L. Cioffi, Marketing Order Admin. Br., Washington, DC 20250. (202) 447-5697.

•**Honey Market News.** Linda Verstrate, USDA-AMS, Fruit & Vegetable Div., 2015 So. 1st St., Rm. 4, Yakima, WA 98903. (509) 575-2492.

•**Price Support Program.** Jane Phillips, Commodity Analysis Division, Agricultural Stabilization and Conservation Service, USDA, Washington, DC 20250. (202) 447-7602.

•**Extension Service (Federal).** Paul W. Bergman, Pesticide: Use & Impact Assessment, USDA, Washington, DC 20250. (202) 447-3511.

•**Biosystematics Research Centre.** Dr. R. J. T. Trottier, Director, Rm. B149, K. W. Neatby Building, Ottawa, Ontario, Canada K1A OC6. (613) 996-1665.

•**Agriculture Canada..** Dr. D. L. Nelson, Dr. T. P. Liu and Dr. T. I. Szabo, Research Station, Research Branch, Agriculture Canada, P. O. Box 29, Beaverlodge, Alta., Canada TOH OCO. (403) 354-2212.

INDUSTRY ORGANIZATIONS

American Bee Breeders Association. Pres. Roy Weaver, Jr., Rt. 1, Box 256, Navasota, TX 77868; First Vice-Pres., Lawrence O'Ferrell, Box 221, LaBelle, FL 33935; Second Vice-Pres., Fred Rossman, P. O. Box 905, Moultrie, GA 31768; Sec. - Treas., Mrs. R. V. Harrell, P. O. Box 215, Hayneville, AL 36040. (205) 548-2313.

American Beekeeping Federation. Pres., Reg Wilbanks, P. O. Box 12, Claxton, GA 30417; Sec.-Treas., Frank A. Robinson, 13637 N. W. 39th Ave., Gainesville, FL 32606. (904) 332-0012.

American Honey Producers Association. Pres., Richard Adee, P. O. Box 368, Bruce, SD 57220, (605) 627-5621; Vice Pres., Jerry Cole, NM.

American Honey Queen 1987. Shiryl Donahoo, Lubbock, Texas.

Apiary Inspectors of America. Pres., Judy Carlson, State Apiary Inspector, N. Dakota Dept. of Agric., State Capitol, Bismarck, ND 58505; Vice Pres., James Bach; Asst. Supervisor, Washington Dept. of Agric., Plant Services Branch, P. O. Box 1064, Kent, WA 98032; Sec., I. Barton Smith, Jr., State Apiary Inspector, MD Dept. of Agric., 50 Harry S. Truman Pkwy., Annapolis, MD 21401 (301) 841-5920; Treas., Willard Kissinger, State Apiarist, Montana Dept. of Agric. & Livestock Bld., Helena, MT 59a620.

California Honey Advisory Board. Marilyn Kiser, Manager, 522 W. Napa St., Box 265, Sonoma, CA 95476. (707) 935-1185.

Eastern Apicultural Society of North America, Inc. Chairman, Robert Cole, Rt. 1, Box 175, Blowing Rock, NY 28605; Sec., Loretta Surprenant, Miner Institute, Chazy, NY 12921, (518) 846-8020. Treas., Don Chirnside, 201 Briarbrook Dr., North Kingstown, RI 02852.

Western Apicultural Society of North America. Pres., Daniel Mayer, IAREC Box 30, Prosser, WA 99350, (509) 786-2226; Vice. Pres, Wayne Robinson, 2210E. Pioneer Ave., Puyallup, WA 98372; Sec., Nancy Stewart, 2400 21st Street, Sacramento, CA 95818, (916) 451-2337; Treas. Ron Neese, 711 College Street, Woodland, CA 95695, (916) 661-3659.

Honey Industry Council of America. Pres., Binford Weaver, Rt. 1, Box 256, Navasota, TX 77868, (409) 825-2312; Sec., Bob Brandi, 1518 Paradise Lane, Los Banos, CA 93635, (209) 826-0921.

Ladie's Auxiliary of ABF. Pres., Kathi Brandi, 1518 Paradise Lane, Los Banos, CA 93635; Vice-Pres., Jan Olson, 4532 Boone Ave., N., New Hope, MN 55428; Sec.-Treas., Judy Haefeli, 3927 N. Rd. 3 W, Monte Vista, CO 81144, (303) 852-3149; Historian, Marilyn King, 607 S. Fuller Drive, Indianapolis, IN 46241.

National Honey Board. Chairman, Dan Hall, 9595 Nelson Road, Longmont, Colorado, (303) 776-2337.

Mid-U.S. Honey Producers Marketing Association. Pres., Gary Reynolds, Box 363, Concordia, KS 66901, (913) 243-3619; Vice-Pres., Bob Barnes, Dillion, MT 59725; Sec.-Treas., Glen Wollman, P. O. Box 458, Parker, SD 57053, (605) 297-4181.

National Honey Packers & Dealers Association. Pres., Neil Miller, Miller Honey Farm, 1167 N. 600 W., Blackfoot, ID 83221; Vice-Pres., Robert Appel, Sunstar Food Inc., 118 Iowa Ave., Streator, IL 61364; Sec.-Treas., David McGinnis; Exec.-Sec., J. Douglas McGinnis, Tropial Blossom Honey Co., P. O. Box 8, Edgewater, FL 32032, (904) 428-9027.

Professional Apiculturists Association. Pres., Eric Mussen, First Vice-Pres., Mark Sugden, Entomology Dept., University of Minnesota, St. Paul, MN 55108; Sec.-Treas., Malcolm T. Sanford, Entomology Extension Dept., University of Florida, Gainesville, FL 32611, (904) 392-1801.

Southern States Beekeepers Federation. Pres., Paul Harrison, Vice Pres, Carol Booth; Recording Sec., Steve Forrest, Rt. 1, Box 135, Moravian Falls, NC 28654.

The Canadian Honey Council. Pres., Dale Hansen, General Delivery, Farmington, B.C. VOC1NO; Vice. Pres., Roger Congdon, R.R. #1, Cottam, Ontario NOR 1BO; Executive Member, Jean Marc Labonte, 530 Road Nault, Victoriaville, Quebec G6P 7R5; Sec. - Treas., Linda Gane, P. O. Box 1566, Nipawin, Sask, SOE 1EO. (306) 862-3011.

Canadian Association of Professional Apiculturists. Pres., Don Dixon, 911 Norguay Bldg., Winnepeg, Manitoba R3C OP8; Vice.-Pres., Doug McCutcheon, 32916 Marshall Rd., Abbottsford, B. C. Canada V25 1K2; Sec.-Treas., LSynthia Scott-Dupre, Dept. of Environmental Biology, University of Guelph, Guelph, Ontario, Canada, N1G 2W1 (519) 824-4120.

American Mead Association. Director, Pamela J. Spence, 4236 Fry Rd., Ostrander, OH 43061.

Agricultural Technical Institute, Beekeeping. Dr. James Tew, Wooster, Ohio 44691. 1-800-647-8283.

INTERNATIONAL ORGANIZATIONS

International Bee Research Association. Vincent A. Cook, 18 North Road, Cardiff, CF1 3DY, UK. Telephone: (0222) 372409, Telex: 23152 monref G 8390.

Apimondia. International Federation of Beekeepers' Associations — President, Raymond Borneck, Rue Du Creux, Montbarrey, France, 3y; General Secretary, 101 Corso Vittorio Emanuele Rome, Italy 00186, (6) 65-12286. Periodical: Apiacta (quarterly).

Note: Where we did not hear from a state or organization, we repeated last year's listing.

REGIONAL ASSOCIATIONS

ALASKA

- **SOUTH CENTRAL AK BEEKEEPERS** — Betty Rhodes, P O Box 141976, ANCHORAGE, 99514
- **KENAI BEEKEEPERS ASSC.** — Edmund Knutsen, P O Box 1525, Soldotna, 99669

ALABAMA

- **JEFFERSON CO BEEKEEPERS** — Ms. Robert Musgrove, 3418 Venus Ln, Fultondale, 35068
- **ETOWAH CO BEEKEEPERS** — James Walker, 419 Cove Creek Rd., East Gadseden, 35903
- **MOBILE CO BEEKEEPERS** — Ben Cox, 7751 Prince James Dr., Mobile, 36619

ARKANSAS

- **CTL ARKANSAS BEEKEEPERS** — Bob Sterling, 17 N Meadow Cliff, Little Rock, 72209
- **WESTERN ARKANSAS BEEKEEPERS** — Anson Gregory, 1520 N 49th St., Fort Smith, 72904

ARIZONA

- **CTRL AZ BEEKEEPERS** — M. Kuzmik, 1544 W. 6 St., Tempe, 85281

CALIFORNIA

- **CA BEEKEEPERS ASSN** — Leslie Ferguson, P O Box 6489, Morena Valley, 92313
- **LOS ANGELES CO BEEKEEPERS** — Matt Reese, 2980 Reposa Lane, Altadena, 91001
- **VENTURA BEEKEEPERS** — Mary Eisman, P O Box 7554, Ventura, 93006
- **SAN FRANCISCO BEE CLUB** — Nash Khayat, 686 Corbett Ave., San Francisco, 94114
- **SAN FRANCISCO BEEKEEPERS** — Lenore Bravo, 47 Levant St, San Francisco, 94114
- **SAN FRANCISCO HOBBY BEEKEEPERS** — John McClure, 810 Gonzalez Dr, 2H, San Francisco, 94132
- **ALAMEDA CO BEEKEEPERS ASSN** — V A Philippi, 4220 Santa Rita Rd, El Sobrante, 94803
- **VALLEY HONEY ASSN** — P O Box 1241, Stockton, 95201
- **SONOMA CO BEE CLUB** — Chuck Sharp, 970 Piner Rd., Santa Rosa, 95401
- **CALIFORNIA BEE BREEDERS** — MC West, 703 Apricot, Winters, 95697

COLORADO

- **COLORADO STATE BEEKEEPERS** — Genevieve Schubenski, 11046 Isabelle Rd., Lafayette, 80026
- **BOULDER CO BEEKEEPERS ASSN** — Lee Brown, 1431 Coring Place, Northglenn, 80233
- **NORTHERN CO BEEKEEPERS** — Scott Waterhouse, 7619 NE CTY LN Rd., Longmont, 80501

CONNECTICUT

- **HAMPDEN CO BEEKEEPERS** — Linda Canders, 108 S Water St., Warehouse Point, 06088
- **WESTERN CT BEEKEEPERS ASSN** — Tom Mulrane, 22 MT Laurel La., Sandy Hook, 06842

DELAWARE

- **SUSSEX CO BEEKEEPERS** — Karen Hall, 10th & Arch ST., Sealord, 19973

FLORIDA

- **WEST CENTRAL FL BEEKEEPERS** — A Murray, RT 3, Box 762-B, Summerfield, 32691
- **SUB TROPICAL BEEKEEPERS** — Lorrain Mann, 15750 SW 217 AVE, Miami, 33187
- **INDIANA RIVER DIST BEEKEEPERS** — Sara Davis, 4111 Oleander Ave., Fort Pierce, 33450
- **LEE CO BEEKEEPERS ASSN** — W H Lohrey, 107 E Lake Dr., Lehigh Acres, 33936

GEORGIA

- **METRO ATLANTA BEEKEEPERS** — C Edwin Smith, 2291 Tilson Circle, Decatur, 30032
- **SPALDING CO BEEKEEPERS** — J R New, P O Box 1000, Griffin, 30223
- **ATHENS AREA BEEKEEPERS** — Ronald Carey, Rt 1, Box 169, Hull, 30646
- **WHITFIELD CO BEEKEEPERS** — M B Davis, 213 W Gordon, Dalton, 30720
- **WALKER CO BEEKEEPERS ASSN** — Ms Louis Huggins, Rt1, Rossville, 30741
- **MACON BEEKEEPERS** — G S Moon, P O Box 5153, Macon 31208
- **COASTAL EMPIRE DEEKEEPERS** — Alan Townley, 923 Dutchtown Rd., Savannah, 31406

HAWAII

- **BIG ISLAND BEEKEEPERS** — P O Box 116, Hakalau, 96710

IOWA

- **CENTRAL IA HONEY ASSN** — Ed Zeiser, Rt 10, Maxwell, 50161
- **IOWA HONEY PRODUCTS ASSOC** — Thomas Wood, 53 30th St., Des Moines, 50312

IDAHO

- **IDAHO BEEKEEPERS ASSOC** — Golden Millet, 1 Box 8 Bee, Marsing, 83639

ILLINOIS

- **NORTHERN IL BEEKEEPERS** — Bruce Mohnen, 3707 Young St., McHenry 60050
- **COOK-DUPAGE BEEKEEPERS** — Ellen Ranson, 30W147 Bruce Lane, Naperville, 60540
- **STATELINE BEEKEEPERS ASSN** — Nancy Ingram, 8384 N Broadway, Apple River, 61001
- **ROCK RIVER VALLEY BEEKEEPERS** — Ernest Holtz, 305 N Horace Ave., Rockford, 61103
- **WESTERN IL BEEKEEPERS** — Martha Bryant, Box 215, Joy, 61260
- **IL VALLEY BEEKEEPERS** — John Stopa, 1831 Campbell, La Salle, 61301
- **HEART OF IL BEEKEEPERS** — Robert DuBois, 423 N Lawndale, Washington, 61571
- **CTL EASTERN IL BEE ASSOC** — Audrey Chapman, P O Box 291, Gifford, 61847
- **TRI-COUNTY BEEKEEPER ASSN** — George Hankamer, 719 W Monroe, Belleville, 62221
- **ST CLAIR BEEKEEPERS ASSN** — Kurt Gross, 125 Fox Run, Sparta, 62286
- **MISS VALLEY BEEKEEPERS** — Bernie Andrew, Rt Box 96A, Loraine, 62349
- **LAKELAND BEEKEEPERS ASSOC** — Norbert Esker, Teutopolis, 62467
- **LINCOLNLAND BEEKEEPERS** — Josef Maurer, 161 Circle Dr., Springfield, 62703

INDIANA

- **NW INDIANA BEEKEEPERS** — Frank Feher, 307 Spectacle Dr., Valpraiso, 46383
- **MICHIANA BEEKEEPERS ASSOC** — Mary Whalen, 53952 CR #17, Bristol, 46507
- **WHITE RIVER VALLEY BEEKEEPERS** — J O Michael, P O Box 172, Washington, 47501
- **RIVER VALLEY BEEKEEPERS** — David Maikranz, RR2, Box 64, Oakland City, 47660
- **TRI-STATE BEEKEEPERS ASSN** — John Ritter, RT 7, Box 368, Evansville, 47712

KANSAS

- **NORTHEASTERN KS BEE ASSOC** — Robert Pemberton, 6614 Riverview, Kansas City, 66102
- **FLINT HILLS BEEKEEPERS** — Ruth Taylor, 526 S Union, Emporia, 66801

KENTUCKY

- **MERCER CO BEEKEEPERS** — Jell McNeese, 1182 Vanarsdell Rd., Harrodsburg, 40330
- **WHITLEY CO BEEKEEPERS** — Eddie Wells, 1917 Lake Ave., Corbin, 40701
- **GREENUP CO BEEKEEPERS ASSN** — Carl Crabtree, Argillite, 41121

LOUISIANA

- **BEEKEEPERS OF SE LA** — 2229 Volpe Dr., Chalmette, 70043
- **CAPITAL AREA BEEKEEPERS** — David Ferguson, 3134 Quebec Dr., Baton Rouge, 70819
- **ARK-LA-TEX BEEKEEPING** — Thomas Noble, P O Box 78435, Shreveport, 71137

MASSACHUSETTS

- **HAMPSHIRE CO BEEKEEPERS** — R Pelissier, 136 East St., So Hadley, 01075
- **HAMPDEN CO BEEKEEPERS** — G H Hughes, Kline Rd., Southwick, 01077
- **BERKSHIRE CO BEEKEEPERS** — Suzanne Delesdernier, 203 Melbourne Rd., Pittsfield, 01201
- **WORCHESTER CO BEEKEEPERS** — Cyril Mapplebeck, 217 Wildwood Ave., Worchester, 01603
- **MIDDLESEX CO BEEKEEPERS** — Eugene Munn, 8 Hill Rd., Boxborough, 01719
- **MERRIMACK VALLEY BEEKEEPERS** — Raymond Devanney, 26 Lawrence Rd., Tyngsboro, 01879
- **NORFOLK CO BEEKEEPERS** — Paul Ares, 275 Massapoag Ave., Sharon, 02067
- **ESSEX CO BEEKEEPERS ASSOC** — Ena Griswold, 166 Shute St., Everett, 02149
- **PLYMOUTH CO BEEKEEPERS** — Frederic Magee, 148 Turnpike St., West Bridgewater, 02379
- **BARNSTABLE CO BEEKEEPERS** — Jean Kennedy, 575 Willow St., West Barnstable, 02668
- **BRISTOL CO BEEKEEPERS** — Joan Ready, 1651 Elm St., Dighton, 02715

MARYLAND

- **CTL MARYLAND BEEKEEPERS** — Layton Stamper, 2835 Scarff Rd., Fallston, 21047
- **SUSQUEHANNA BEEKEEPERS** — Donald Mazor, 11817 S Chapman Rd., Kingsville, 21087
- **CENTRAL BEEKEEPERS ASSOC** — Ted Merchant, 7 Old Garret Ct., White Hall, 21161

MAINE

- **PENQUIS BEEKEEPERS ASSOC** — David Newcomb, Rt1, Box 110A, Hampden Highlands, 04445
- **DOWNEAST-ME ST BEEKEEPERS** — James Reed, RFD 1, Box 2625, Bar Harbor, 04609

MICHIGAN

- **MICHIGAN BEEKEEPERS ASSOC** — Bernadette Dean, 3132 Beechtree, Lake Orion, 48035
- **MACOMB CO BEEKEEPERS ASSN** — Ms Kurt Ciper, 37477 Union Lake Rd, RT4, Mount Clemens, 48043
- **SOUTHEASTERN MI BEE ASSOC** — Julia Pushaw, 702 Oakley Park Rd., Walled Lake, 48088
- **SOUTHWEST MI BEEKEEPERS** — Christine Dahlke, 4908 Hillandale Rd., Sodus, 49126
- **JACKSON CO BEEKEEPER ASSN** — Kenneth Losey, 6962 Folks Rd., Horton, 49246
- **CHAR-EM BEEKEEPERS ASSOC** — Grace Baumgartner, P O Box 47, Oden 49764

MINNESOTA

- **MN HOBBY BEEKEEPERS ASSOC** — Wesley Waring, 2534 Quincy St, NE, Minniapolis, 44518
- **MN BEEKEEPERS ASSN** — Jack Thomsen, RT1, Glenwood, 56334
- **MN HONEY PRODUCERS** — Paul Maassel, RT 4, Box 52, Moorhead, 56560
- **LAKE REGION BEEKEEPERS,** — Russel Hofman, Richville, 56576

MISSOURI

- **JEFFERSON CO BEEKEEPERS** — W Sexauer, RT 4, Box 540, De Soto, 63020
- **EASTERN MO BEEKEEPER ASSN** — Larry Hensley, 13520 Old Jamestown Rd., Florissant, 63033
- **MISSOURI VALLEY BEEKEEPERS** — Bill Kohne, RT 2, Box 43, Sullivan, 63080
- **LINCOLN CO BEEKEEPERS** — Margaret Hornburg, RT 1-A, Box 314, Hawk Point, 63349
- **TWO RIVERS BEEKEEPERS ASSN** — Goldie Reynolds, RT1, Box 107, High Hill, 63350
- **NORTH MISSOURI BEEKEEPERS** — Ronald Whitacre, Box 33, Glenwood, 63541
- **MIDWESTERN BEEKEEPER ASSN** — Ron Vivian, Rt 1, Box 35A, Bates City, 64011
- **WORTH CO BEEKEEPERS** — Floyd Rinehart, RT1, Grant City, 64456
- **HONEY PRODUCERS** — Phyllis Bond, RT 1M, Box 46, Olean, 65064
- **CENTRAL MO BEEKEEPERS** — Margaret West, 817 Airview Dr., Jefferson City, 65101
- **BOON REGIONAL BEEKEEPERS** — Wayne Thomas, 2514 Brookside Court, Columbia, 65201
- **N CENTRAL MO BEE ASSOC** — R W Bauer, Rt 2, Box 155, Huntsville, 65259

- **LACLADE CO BEEKEEPERS** — Liz Gregory, Rt3, Box 45, Plato, 65552
- **DALLAS CO BEEKEEPERS** — Myrna Schultz, Rt 2, Box 159, Urbana, 65767
- **SOUTHWEST MO BEE ASSOC** — E S Haddock, Verona, 65769
- **OZARK BEEKEEPERS ASSOC** — Truman Hardin, 1829 W Washita, Springfield, 65807

NEBRASKA

- **NEBRASKA BEEKEEPERS ASSOC** — Jim Olingle, Loup City, 68853

NORTH CAROLINA

- **ROCKINGHAM CO BEEKEEPERS** — Ms B P Fox, 102 North 7th Ave, Mayodan 27027
- **DAVIE CO BEEKEEPERS ASSN** — Dorris Dillon, Rt3, Box 590, Mocksville, 27028
- **WILSON CO BEEKEEPERS ASSN** — Harvey Denton, Rt2, Box 50-B, Bailey, 27087
- **FORSYTH CO BEEKEEPERS ASSN** — Naomi Sloam, 1400 Demetrias Dr., Winston Salem, 27103
- **RANDOLPH CO BEEKEEPERS** — H J Weiler, Jr., 1239 Thayer Dr., Asheboro, 27203
- **CASWELL CO BEEKEEPER ASSN** — Paul Myers, Rt1, Box 133, Blanch, 27212
- **NC STATE BEEKEEPERS ASSN** — James Bryant, 1208 Briarcliff Rd., Burlington, 27215
- **ALAMANCE CO BEEKEEPERS** — Donald Moore, RT 2, Box, 394X, Elon College, 27244
- **GUILFORD CO BEEKEEPERS** — Edward Snyder, 5400 Bosher Lake Dr., Mcleansville, 27301
- **MONTGOMERY CO BEEKEEPERS** — Archie Craven, Rt, Box 231, Mount Gilead, 27306
- **LEE CO BEEKEEPERS ASSOC** — W. Lynn Spivey, 120 E Weatherspoon St., Sanlored, 27330
- **CHATHAM CO BEEKEEPER ASSN** — Harold Ellis, Rt 3, Box 8-E, Siler City, 27344
- **GREENSBORO BEEKEEPERS** — Henry Moon, 2416 Wright Ave., Greensboro, 27403
- **JOHNSTON CO BEEKEEPERS** — R G Adams, 507 Morris Ave., Benson, 27504
- **WAKE CO BEEKEEPERS ASSOC** — Howard Plemmons, 103 Crystal Court, Cary 27511
- **WAYNE CO BEEKEEPERS ASSOC** — Louise Sasser, 108 E Westwood Dr., Goldsboro, 27530
- **ORANGE CO BEEKEEPERS ASSOC** — John Rigdon, Rt 7, Box 224, Durham, 27707
- **DURHAM CO BEE CLUB** — Ellis Selph, 2502 Winton Rd., Durham, 27707
- **EDGECOMBE CO BEEKEEPERS** — Peggy Weatherford, Rt 2, Box 162, Battleboro, 27809
- **PITT CO BEEKEEPERS ASSOC** — Scott Flanagan, 501 Grimmersburg St., Farmville, 27828
- **CHOANOKE BEEKEEPERS ASSOC** — Frank Stevenson, 301 E Broad St., Murfreesboro, 27855
- **ALBERMARLE REGIONAL BEE CLUB** — Wink Munden, 506 Hemlock Ave, Elizabeth City, 27909
- **GASTON CO BEEKEEPERS ASSN** — Harold Cline, 840 Churchill Dr., Gastonia, 28052
- **MACKLENBURG CO BEEKEEPERS** — Bob Blackwelder, 10409 Puckett Rd., Huntersville, 28078
- **LINCOLN CO BEEKEEPERS ASSN** — Victor Rudisoll, 926 E Park Dr., Lincolnton, 28092
- **RUTHERFORD CO BEEKEEPERS** — Arthur Stchley, Rt 3, Rutherfordton, 28139
- **ROWAN CO BEEKEEPERS ASSN** — James Ijames, 211 W McCubbins St., Salisbury, 28144
- **CABARRUS CO BEEKEEPERS** — Charles Ball, Rt 11, Box 373, Salisbury, 28144
- **CUMBERLAND CO BEEKEEPERS** — Berline Beal, 2602 Stonehaven Dr., Fayetteville, 28306
- **SAMPSON CO BEEKEEPERS** — Florence Beretich, Rt 3, Box 14, Clinton, 28328
- **ROBESON CO BEEKEEPER ASSN** — V E Smith, Rt 1, Box 17, Lumberton, 28358
- **HOKE CO BEEKEEPERS ASSOC** — Betty Freeman, Rt 2, Box 527, Raeford, 28376
- **RICHMOND CO BEEKEEPERS** — Ruth Barbee, Rt 3, Box 368-B, Rockingham, 28379
- **NEW HANOVER CO BEEKEEPERS** — Jim Tyer, Rt 1, Box 567, Wilmington, 28405
- **COLUMBUS-BRUNSWICK BEEKEEPERS** — Sylvia Martin, Rt 2, Box 306, Chadbourn, 28431
- **LENOIR CO BEEKEEPERS ASSN** — H C Hoffman, Rt 7, Box 316, Kinston, 28501
- **PAMLICO CO BEEKEEPERS** — Susan Herring, P O Box 84, Bayboro, 28515
- **ONSLOW CO BEEKEEPERS** — Maurice Cook, Rt 4, Box 167, Jacksonville, 28540
- **TRI-CO BEEKEEPERS ASSOC** — Nate Salsbury, 608 Madame Moore's Lane, New Bern, 28560
- **CARTERET CO BEEKEEPERS** — Harry Lockey, Jr., Rt 2, Box 226, Newport, 28570
- **CATAWBA VALLEY BEEKEEPERS** — Jim Peeler, Rt 11, Box 397, Hickory, 28601
- **TREDELL CO BEEKEEPERS** — Bob Kale, Rt 2, Box 63, Catawba, 28609
- **SURRY CO BEEKEEPERS ASSN** — Z Wayne Thompson, Rt 1, Box 179, Elkin, 28621
- **ALLEGHANY CO BEEKEEPERS** — Bryon Woodruff, Rt 1, Box 139, Glade Valley, 28627
- **WILKES CO BEEKEEPERS ASSN** — Grant Miller, Rt 2, Box 321-B, Millers Creek, 28651
- **BURKE CO BEEKEEPERS ASSN** — Clarence Justice, Rt 2, Box 530-E, Morganton, 28655
- **WATAUGA CO BEEKEEPERS** — Alicia Breton, P O Box 13, Todd, 28684
- **SWAIN CO BEEKEEPING CPTR** — M G Sanderson, Rt 2, Box 608, Bryson City, 28713
- **JACKSON CO BEEKEEPERS ASSN** — Robert Anders, P O Box 8, Cullowhee, 28723
- **HENDERSON CO BEEKEEPERS** — Bitton Allison Jr., Horse Shoe, 28742
- **TRANSYLVANIA CO BEEKEEPERS** — James Bates, Star Rt Box 580, Rosman, 28772
- **MITCHLL CO BEEKEEPERS ASSN** — T V Hall, Rt 2, Box 1225, Spruce Pine, 28777
- **HAYWOOD CO BEEKEEPERS** — Cormell Hollingworth, 1322 Allens Creek, Waynesville, 28786
- **BUNCOMBE CO BEEKEEPERS** — Jean Comyns, Rt 2, Box 638, Asheville, 28805

NEBRASKA

- **EASTERN NE HONEY PRODUCERS** — Darrel Abele, 7232 Webster St., Lincoln, 68152
- **NORTHEAST NE BEEKEEPERS** — Elda Pfanstiel, RR 1, McLean, 68747

NEW HAMPSHIRE

- **NH STATE BEEKEEPERS ASSN** — Francis Dodge, P O Box 91, Goffstown, 03045

NEW JERSEY

- **MORRIS CO BEEKEEPERS** — Ann Tischbein, 59 Haas Rd., Basking Ridge, 07920
- **ESSEX CO BEEKEEPERS SOC** — Marion Chandler, 85 Deerfield Rd., W Caldwell, 07006
- **NE BEEKEEPERS ASSOC, NJ** — Jeannette Stoel, 519 Farview St., Ridgewood, 07450
- **CENTRAL JERSEY BEEKEEPERS** — Inga Littig, P O Box 306, Lakehurst, 08733

NEW YORK

- **LONG ISLAND BEEKEEPERS** — Ginny Lackey, 1260 Walnut Ave., Bohemia, 11716
- **SUFFOLK CO BEE CLUB** — H D Wills, 24 River Ave., Riverhead, 11901
- **SOUTHEASTERN BEEKEEPERS CLUB** — Kathleen Smith, Rt 209, Cuddebackville, 12729
- **MID-YORK BEEKEEPERS ASSN** — Richard Wood, Rt 4, Soule Rd., Rome, 13440
- **SOUTHERN TIER BEEKEEPERS** — H W Shoemaker, 3 Spring Lane, Binghamton, 13903
- **WESTERN NY HONEY PRODUCERS** — Sally Potczak, 541 Bell Rd., Corfu, 14036
- **MONROE CO BEEKEEPERS** — Gale Miller, 389 Dewey St., Churchville, 14428
- **CHAUTAUQUA CO BEEKEEPERS** — John Kost, 1408 Bunce, Frewsburg, 14738

OHIO

- **FRANKLIN CO BEEKEEPERS** — Vera Gorochow, 3563 Byers Rd., Delaware, 43015
- **KNOX CO BEEKEEPERS ASSN** — Harold Bower, 14258 Beckley Rd., Mt. Vernon, 43050
- **CENTRAL BEEKEEPERS ASSN** — Vernon Chute, 1635 N Hague Ave., Columbus, 43204
- **CENTRAL OH BEEKEEPERS** — David Casdorph, 4111 Maize Rd., Columbus, 43224
- **MORROW CO BEE ASSN** — Rebecca Gilliland, 1299 Nancy Lane, Columbus, 43227
- **MARION CO BEEKEEPERS ASSN** — Brent Willis, 289 Fairview St., Marion, 43302
- **LOGAN CO BEEKEEPERS ASSN** — Ms James Eaton, Rt 1, Mount Victory, 43340
- **GUERNSEY CO BEEKEEPERS** — Neal Murdock, 69615 Old 21 Rd., Cambridge, 43725
- **MUSKINGUM CO BEEKEEPERS** — Marilyn Dailey, 1075 Rix Mills Rd., New Concord, 43762
- **MID OHIO VALLEY BEEKEEPERS** — Diane Lorenz, Rt 3, Stockport, 43787
- **TUSCARAWAS CO BEEKEEPERS** — Helen Ott, 28342 Cr 281, Newcomerstown, 43832
- **JEFFERSON CO BEEKEEPERS** — Guy Martin, Rt 1, Rainbow Dr., Bloomingdale, 43910
- **GEAUGA BEEKEEPERS ASSN** — Lynn Hershberger, P O Box 334, Burton, 44021
- **LORAIN CO BEEKEEPERS ASSN** — Melvin Thompson, 1741 Grafton Rd., Elyria, 44039
- **LAKE CO BEEKEEPERS ASSN** — Russell Dodge, Box 36, Southern St., Unionville, 44088
- **CUYAHOGA CO BEEKEEPERS** — Dorothy Kowall, 323 Bishop Rd., Highland Heights, 44143
- **MEDINA CO BEEKEEPERS** — Vince Yambrovich, 9661 Stone Rd., Litchfield, 44253
- **PORTAGE CO BEEKEEPERS** — Lucille Kibler, St Rt 5-7291, Ravenna, 44266
- **SUMMIT CO BEEKEEPERS** — Theodore Monegan, 3860 N Grant St., Richfield, 44286
- **TRUMBULL CO BEEKEEPERS** — Joann Elmore, 9244 Ward, North, Klnsman, 44428
- **COLUMBIANA CO BEEKEEPERS** — Grace Hamilton, Rt1, Lisbon, 44432
- **COLUMBIANA & MAHONING CO BEEKEEPERS**
- Rhoda Reynolds, 2477 Columbiana Rd., New Springfield, 44443
- **CARROLL CO BEEKEEPERS** — Kim Pallaye, 4107 Ivory Rd., NW, Carrolton, 44615
- **STARK CO BEEKEEPERS** — Penny Horvath, 828 Wellman Ave, SE, Massillon, 44646
- **TRI-COUNTY BEEKEEPERS ASSN** — Jim Kinney, 1560 Woodcrest, Wooster, 44691
- **RICHLAND CO BEEKEEPERS** — Brian Wade, Rt1, Garber Rd., Bellvelle, 44813
- **WARREN CO BEEKEEPERS** — Oscar Brown, 7154 Hopkins Rd., Maineville, 45039
- **BUTLER CO BEEKEEPERS** — Karen Rupp, 6483 Layhigh Rd., Okeana, 45053
- **HIGHLAND CO BEEKEEPERS** — Cora Prye, 7926 Wright Rd., Hillsboro, 45133
- **SOUTHWESTERN OH BEE ASSN** — Don Cooke, 731 Miami Ave, Terrace Park, 45174
- **GREENE CO BEEKEEPERS** — O K Simison, Rt 1, Spring Valley, 45370
- **MIAMI CO BEEKEEPERS** — Sara Newbright, 4555 Walnut Gr Rd., Troy, 45373
- **MONTGOMERY CO BEEKEEPERS** — Jean Allen, 828 Allenhurst Ave., Vandalia, 45377
- **CLARK CO BEEKEEPERS** — Rolland Anderson, 1312 N Lowry Ave, Springfield, 45504
- **ROSS CO BEEKEEPERS ASSN** — Fred Weaver, 27 Courtland Dr., Chillicothe, 45601
- **LAWRENCE CO BEEKEEPERS** — Maxine Bowman, Rt 3, Box 191, Ironton, 45638
- **SCIOTO CO BEEKEEPERS** — Judy Bradbury, Rt 2, Minford, 45653
- **HOCKING CO BEEKEEPERS** — Annette McClain, 20193 St Rt 328, New Plymouth, 45654
- **MID-OHIO VALLEY BEEKEEPERS** — Janet Davis, Rt 1, Box 160, Waterford, 45786
- **NW OHIO BEEKEEPERS ASSN** — Leroy Shoultz, 233 Elm St., Findlay, 45840

OKLAHOMA

- **NE OKLAHOMA BEEKEEPERS** — James Grayson, Rt 1, Box 189 B, Owasso, 74055
- **FOUR STATE BEEKEEPERS ASSN** — Louise Bean, Rt 6, Box 467, Grove, 74344
- **INDIAN NATION BEEKEEPERS** — Wayne Richison, 2700 Jefferson Court, Muskogee, 74403
- **RED RIVER BEEKEEPERS ASSN** — Louis Stallings, HC 70, Box 6, Boswell, 74727
- **SE OKLAHOMA BEEKEEPERS** — Dorothy Grigsby, Rt 1, Box 915, Broken Bow, 74738

OREGON

- **TUALATIN VALLEY BEEKEEPERS** — George Robins, 1255 SW Taylors Ferry, Portland, 97219
- **LANE CO BEEKEEPERS** — James Sheridan, 1885 Norkenzie Rd., Eugene, 97401
- **COOS CO BEEKEEPERS** — Jack Piper, 2444 McLain Libby Dr., Coos Bay, 97420

PENNSLYVANIA

- **CENTRAL WSTRN PA BEE ASSN** — Nancy Paffenroth, Unionville Rd., Evans City, 16033
- **CLARION CO BEEKEEPER ASSN** — R W McHenry, Front St, Box 176, Sligo, 16255
- **NORTHWESTERN PA BEEKEEPERS** — Jeff Allio, Rt 3, Nickleplate Rd., Cochranton, 16314
- **VENANGO CO BEEKEEPERS** — Ms Ernest Montogomery, Rt 4, Box 14, Franklin, 16323
- **POTTER CO BEEKEEPERS ASSN** — LLoyd Tyler, Rt 3, Coudersport, 16915
- **DAUPHIN CO BEEKEEPERS ASSN** — Donald Zimmerman, 6249 Cider Press Rd., Harrisburg, 17111
- **FRANKLIN CO BEEKEEPERS** — Sharon Barr, 191 Franklin Farms La., Chambersburg, 17201
- **YORK CO BEEKEEPERS** — William Spahr, Rt 1, Dover, 17315
- **LYCOMING CO BEEKEEPERS** — Fred Robinson, 1730 Ravine Rd., Williamsport, 17702
- **LEHIGH VALLEY BEEKEEPERS** — Raemond Birnbaum, P O Box 272, Kresgeville, 18333
- **LACKAWANNA CO BEEKEEPERS** — Esther Ziegler, Rt 1, Dalton, 18414
- **WAYNE CO BEEKEEPERS ASSN** — Francis Motichka, 417 Carroll St., Honesdale, 18431
- **LUZERNE CO BEEKEEPERS** — Ernest Young, 347E Noble St., Naticoke, 18634
- **BUCKS CO BEEKEEPERS** — Eugene Pester, 512 Feaster Ave., Feasterville, 19048
- **MONTGOMERY CO BEEKEEPERS** — W D Middleton, 113 Country Lane, Lansdale, 19446
- **SCHUYKILL CO BEEKEEPERS** — Richard Malick, 220 Cherry Dr., Wyomissing, 19610

SOUTH CAROLINA

- **MID-STATE BEEKEEPING ASSN** — Jame Paradeses, 340 Bradley Rd., West Columbia, 29169
- **YORK CO BEEKEEPERS ASSN** — Ms I T Hepp, Leslie Highway, Rock Hill, 29732

SOUTH DAKOTA

- **BROWN CO BEEKEEPERS** — Eva Wilson, 1703 Royal Rd., Aberdeen, 57401

TENNESSEE

- **DICKSON CO AREA BEEKEEPERS** — Elaine Smith, Rt 1, Box 7c, Cumberland Furnace, 37051
- **STONES RIVER BEEKEEPERS** — Raleigh Marlin, Rt 1, Box 230, Christiana, 37057
- **WILSON CO BEEKEEPERS ASSN** — Felix Preston, Rt 7, Box 104, Lebanon, 37087
- **DUCK RIVER BEEKEEPERS ASSN** — Leslie Little, 831 Union St., Shelbyville, 37160
- **NASHVILLE AREA BEEKEEPERS** — Allan Davis, 137 Spring Valley Rd., Nashville, 37214
- **SEVIER CO BEEKEEPERS ASSN** — Harry Yarnell, P O Box 354, Seymour, 37265
- **RHEA CO BEE ASSN** — H L Tipps, Dayton, 37321
- **CHEROKEE BEEKEEPERS ASSN** — Ms David Robinson, Rt Box 606, Decatur, 37322
- **LINCOLN CO BEEKEEPERS** — Margaret Jennings, Rt 2, Fayetteville, 37334
- **MONROE CO BEEKEEPERS ASSN** — E E Hagler, Madisonville, 37354
- **TN HONEY PRODUCERS/PACKERS** — Charles Neal, 7525 Georgetown Rd., OOltewah, 37363
- **FRANKLIN CO BEEKEEPERS** — James Duncun, Rt 2, Winchester, 37398
- **CHATTANOOGA AREA BEEKEEPERS** — Joe Kilpatrick, 834 Runyan Dr., Chattanooga, 37405
- **HAMILTON CO BEEKEEPERS** — Ms J D Humberd, 8528 East Brainerd Rd, NE, Chattanooga, 37421
- **WASHINGTON CO BEEKEEPERS** — Jeff Jenkins, Rt 11, Box 465, Gray, 37615
- **UNICOI CO BEE ASSN** — Enloe Hensley, Rt 2, Erwin, 37650
- **TRI-CITY BEEKEEPERS ASSN** — John Frey, Rt 4, Big Ridge Rd., Kingsport, 37660
- **LOUDON CO BEEKEEPERS** — Jim Goodman, Rt 4, Box 217A, Lenoir City, 37771
- **BLOUNT CO BEEKEEPERS** — Homer Wrinkle, 1226 Everett Ave., Maryville, 37801
- **MCMINN CO BEEKEEPERS ASSN** — R D Malone, Lake View Farm, Niota, 37826
- **ANDERSON CO BEEKEEPERS** — Ms William Whitters, 15 Newhope Lane, Oak Ridge, 37830
- **KNOX CO BEEKEEPERS ASSN** — Dan Donaldson, 3832 Calaford Dr., Knoxville, 37918
- **TIPTON CO BEE ASSN** — Ira Sellers, Covington, 38019
- **MEMPHIS AREA BEEKEEPERS** — Dean Bush, 1948 Prado Ave., Memphis, 38116
- **WEAKLEY CO BEE ASSN** — A M Walker, Dresden, 38225
- **HENDERSON CO BEE ASSN** — E G Woody, Scotts Hill, 38374
- **GIBSON CO BEEKEEPERS** — James Gee, Trenton, 38382
- **COLUMBIA BEEKEEPERS** — Lona Vaughn, Rt 7, Box 123, Columbia, 38401
- **LEWIS CO BEEKEEPERS** — Allen Martin, P O Box 2306, Crows Hollow, Hohenwald, 38462
- **LAWRENCE CO ASSOC** — Ralph Ring, Lawrenceburg, 38464
- **JACKSON CO BEE ASSN** — R C Smith, Gainesboro, 38562
- **OVERTON CO BEE ASSN** — H B Garrison, Livingston, 38570
- **CUMBERLAND AREA BEEKEEPERS** — Ms Lorraine Geer, Rt 9, Box 146, Sparta, 38583

TEXAS

- **COLLIN CO HOBBY BEEKEEPERS** — C Moody, 2182 Country Lane, McKinney, 75069
- **TRINITY VALLEY ASSN** — Cynthia House, 103 Forest Brook Dr., Red Oak, 75154
- **TEXOMA ASSOCIATION** — Russell Green, P O Box 164, Ector, 75439
- **EAST TEXAS ASSOCIATION** — Dick Counts, Box 2014, Tyler, 75710
- **ANDERSON CO BEEKEEPERS** — Tony Gunnels, 208 Fifth St., Palestine, 75801
- **RED RIVER VALLEY ASSN** — Benny Watson, 1952-A Hines, Wichita Falls, 76303
- **NORTH CTRL TX BEEKEEPERS** — Virgil Woodfin, 200 S Park, Iowa Park, 76367
- **ERATH COUNTY ASSN** — Carroll Cawyer, 1433 No Dale, Stephenville, 76401
- **CENTRAL TX BEEKEEPERS** — Ty Simpson, 616 N Beal, Belton, 76513
- **CONCHO VALLEY ASSN** — Travis Lane, 6427 Goodland Loop, San Angelo, 76901
- **HARNS CO BEEKEEPERS** — Bonnie Hamala, 5623 Berry Creek, Houston, 77017
- **NORTH HARRIS CO ASSN** — John McCall, 5025 Hanwick St., Houston, 77093
- **HOUSTON BEEKEEPERS ASSN** — Don Lopshire, P O Drawer 35319, Houston, 77235
- **WALKER CO ASSN** — BR Murphy, Box 7129, Huntsville, 77340
- **WALKER CO BEEKEEPERS** — Steve Laube, P O Box 7129, Huntsville, 77342
- **MONTGOMERY CO BEEKEEPERS** — Betty Moore, Rt 3, Box 192C, Montgomery, 77356
- **FORT BEND ASSN** — Pat Westmoreland, P O Box 178, Fulshear, 77441
- **GALVESTON CO ASSN** — Margie Coplin, 3512 Jack Beaver Rd., Arcadia, 77517
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- **GOLDEN TRIANGLE ASSN** — Luther Simmons, 3705 Bulfalo Circle, Beaumont, 77703
- **WASHINGTON CO ASSN** — E C Lemke, Rt 4 Box 47B, Brenham, 77833
- **BRAZOS VALLEY ASSN** — John Pullen, Rt 3, Box 398, College Station, 77841
- **VICTORIAL CO ASSN** — Wayne Smith, Rt 4, Cuero Hwy, Victoria, 77904
- **TEXAS HONEY CO-OP** — P O Box 14292, San Antonio, 78214
- **ALAMO AREA BEEKEEPERS ASSN** — Eva Pireto, 6418 Redbird Lane, San Antonio, 78240
- **COASTAL BEND BEEKEEPERS** — Jack Padgett, 9566 Goldcrest, Corpus Christi, 78418
- **RIO GRANDE VALLEY ASSN** — Ben Gonzales, P O Box 108, Weslaco, 78596
- **WILLIAMSON CO ASSN** — Mary Bost, Rt 3, Box 60, Georgetown, 78626
- **AUSTIN AREA BEEKEEPERS** — Gary Hallock, 1124-A Clayton Lane, Austin, 78723
- **CAPITOL AREA BEEKEEPERS** — A J Adair, 1507 Summit St., Austin, 78741
- **SOUTH PLAINS BEEKEEPERS** — James Colson, P O Box 2247, Lubbock, 79408
- **PERMIAN BASIN ASSN** — James Brittingham, 2312 North Adams, Odessa, 79761
- **EL PASO ASSN** — Ray Pierce, 1616 James Chisum, El Paso, 79925

UTAH

- **WASATAH BEEKEEPERS ASSN** — Gerri Withers, 8349 S 100 E, Sandy 84070

VIRGINIA

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- **LOUDOUN BEEKEEPERS ASSN** — Phillip Clarke, Rt 2, Box 274, Lovettsville, 22080
- **NORTHERN VA BEEKEEPERS** — Nancy Davis, 10907 Thanlet Lane, Reston, 22090
- **PRINCE WILLIAM BEEKEEPERS** — Jean Chitren, 15250 Dumfries Rd., Manassas, 22111
- **BANV** — William Syrett, 5230 Oldcastle Lane, Springfield, 22151
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- **NASA-LANGLEY APIC CLUB** — Mary Ward, P O Box 712, Gloucester Point, 23062
- **POWHATAN BEEKEEPERS ANNS** — Ms Clair Justis, P O Box 235, Powhatan, 23139
- **GOOCHLAND BEEKEEPERS ASSN** — A L Hollins, Box 218-A, Sandy Hook, 23153
- **TRI-CITY BEEKEEPERS ASSN** — William Dunham, III, 2920, Weschester Rd, Richmond, 23225
- **TIDEWATER BEEKEEPERS ASSN** — Clarise Hennig, 1701 Cromwell Dr., Norfolk, 23509
- **RICHMOND BEEKEEPERS ASSN** — Helen Goyne, 11741 Boyd Rd., Chester, 23831
- **BLUE RIDGE BEEKEEPERS ASSN** — Ms Lee Bristor, 1229 McDowell Ave, NW, Roanoke, 24012
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- **TIDEWATER APIC FOUNDATION** — Anthony Moll, Rt 2, Box 189, Newport, 24128
- **SW PIEDMONT BEEKEEPERS OF VA** — E P Compton, Rt, 3, Box 641, Ridgeway, 24148
- **MOUNTAIN EMPIRE BEEKEEPERS** — Edwin Wilson, P O Box 499, Wytheville, 24382
- **VA COMMERCIAL BEEKEEPERS ASSN** — M C Ludlum, 1112 Pierce St., Lynchburg, 24501
- **PIEDMONT BEEKEEPERS ASSN** — Ms A A Blanks, Rt 1, Long Island, 24569
- **CTL VA BEEKEEPERS ASSN** — David Schumaker, Rt 2, Box 530, Scottsville, 24590

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- **SKAGIT VALLEY BEEKEEPERS** — Dottie Burr, 1101 Peacock Lane, Burlington, 98233
- **WHIDBEY ISLAND BEEKEEPERS** — Bill Karlinsey, P O Box 535, Coupeville, 98239
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- **COWLITZ CO BEEKEEPERS ASSN** — Eva Davis, 3956 Columbia Hts Rd., Longview, 98632
- **WASH ST BEEKEEPERS** — Arlene Massey, Rt 1, Box 1406-A, Grandview, 98930
- **ISLAND EMPIRE BEEKEEPERS** — Ms Rae Bateman, 12018 E Boone, Spokane, 99206
- **THREE RIVERS BEEKEEPERS** — Albert Beem, 2003 Davison, Richland, 99352

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- **OZAUKEE-WASHINGTON CO BEEKEEPERS** — Ms Agnes Curry, P O Box 391, West Bend, 53095
- **RACINE-KENOSHA CO BEEKEEPERS** — Carolyn Fanelli, W150 S 6959 Cornell Cir, Muskego, 53150
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- **MANITOWOC CO BEEKEEPERS** — Ms Gerald Mack, Rt 2, Box 96, Reedsville, 54230
- **BROWN CO BEEKEEPERS** — Thomas Cashman, 1415 E Mason St., Green Ban, 54301
- **MARATHON CO BEEKEEPERS** — Ms Albert Sahr, 1901 E Wausau Ave., Wausau, 54401
- **TAYLOR-CLARK BEEKEEPERS** — Florette Kohn, W7377 CtO, Medford, 54451
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- **BENWOOD BEEKEEPERS** — Jim Pittman, 519 Boggs Rd., Benwood, 26031
- **HAMPSHIRE CO BEEKEEPERS** — Ruth Cahn, High View, 26808

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- **KALOWNA BEEKEEPERS** — W G Glower, 2203 Woodlawn St., Kalowna, BC
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- **NELSON BEEKEEPERS** — Ivan Lewis, 1309 McQuarrie Ave., Prince George, Nelson, BC
- **FRASER VALLEY BEEKEEPERS** — James Medill, 14708-68 Ave., SurreyV3s 2B1, BC
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- **QUINTE BEEKEEPERS ASSN** — N E Orr, General Delivery, Woolerkok 3MO, Ont
- **P E ISLAND BEE CO-OP ASSN** — J Dan Mcaskill, P O Box 1114, Charlottetow C1A 7MB, Prince Edward Island
- **ASSOC DES APIC PROF PQ** — RogerDoyon, 57 Perrad, Napierville CO, St Remi, Que
- **ASSOC DES AGRICULTEURA-PQ** — Robert Villeneuve, 58 Est Colomlere, Quebe G1L IR1 1R1, Que

ROOT™

Dear Beekeeping Friend,

The day when beekeepers routinely use pesticides inside a beehive may soon be a reality, but it is not here **YET!**

There has been much interest in chemical controls for Varroa Mites, and, to avoid ANY misunderstandings, confusion, or legal complications for chemical manufacturers, wholesale and retail suppliers, and most importantly our customers, these are the facts as we know them:

- As of March 11, 1988, there are **NO** chemicals available for common use by beekeepers to control Varroa Mites.

- A Section 18 label has been approved by the appropriate Federal authorities for a product to be used *by or under the supervision of Federal or State Certified Pesticide Applicators.*

Until **ANY** product receives a Section 3 label and/or is approved for common use by beekeepers, *THE A. I. ROOT COMPANY* will not offer for sale any chemical control product for Varroa Mite. It is the philosophy of *THE A. I. ROOT COMPANY* that our customers safety and well-being are our foremost concern.

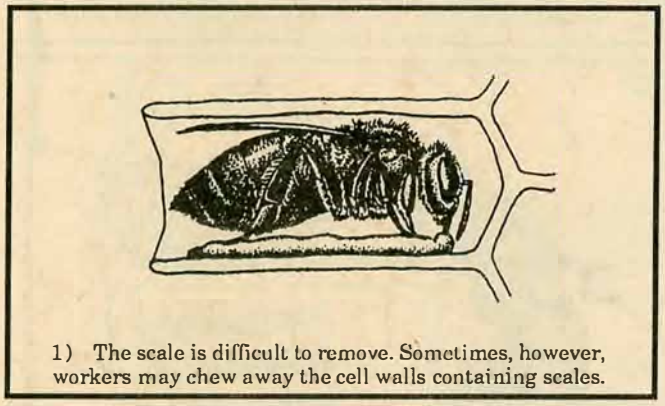
We are aware of the product(s) currently under Federal control, and will do our best to keep our customers informed of the changes in labeling restrictions. When these products are approved for *general* use, with appropriate Federal guidelines, *THE A. I. ROOT COMPANY* will make them available to our customers as soon as possible. **NOT BEFORE.**

Dick Kehl

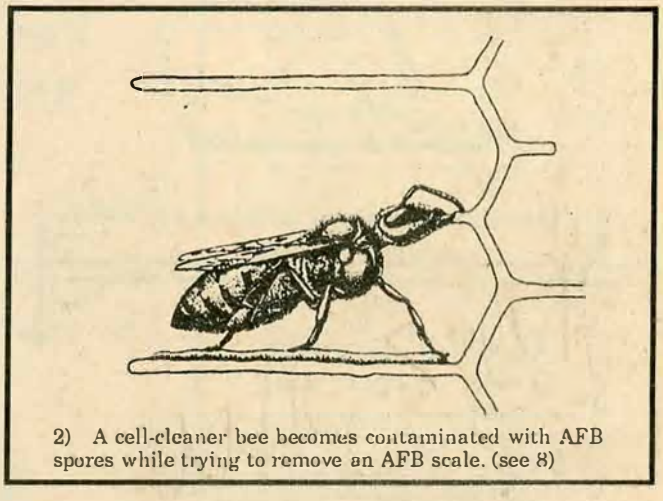
THE A. I. ROOT CO. • 623 WEST LIBERTY STREET • P. O. BOX 706 • MEDINA, OHIO 44258 • (216) 725-6677 • TELEX 753856 (ROOT UD)

American Foulbrood:

How It Spreads



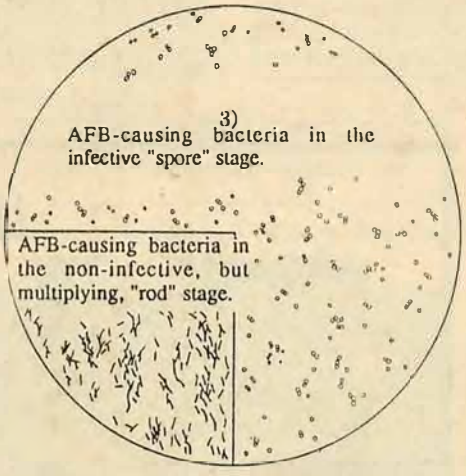
1) The scale is difficult to remove. Sometimes, however, workers may chew away the cell walls containing scales.



2) A cell-cleaner bee becomes contaminated with AFB spores while trying to remove an AFB scale. (see 8)

In many parts of the world, including North America, American foulbrood (AFB) is a serious disease of honey bee brood. Of great importance in understanding diseases is a knowledge of how they spread. As with other diseases of the honey bee, the spread of AFB can conveniently be divided into two aspects. (1) spread between colonies — which results in uninfected colonies becoming infected; (2) spread (or possibly decline of infection) within an infected colony — which results in the colony being killed (or recovering). This article addresses only the build up and elimination of AFB within a colony. Many of the steps in the process are depicted in the accompanying illustrations.

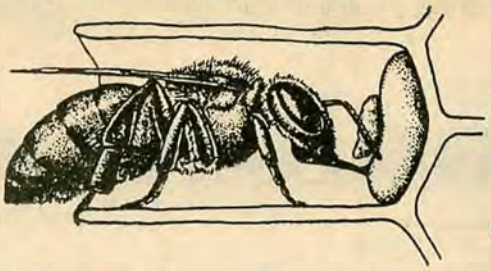
Imagine that a honey bee colony has only one, or a few, cells containing AFB-infected larvae, but no other AFB infection or spores in the colony. (This probably occurs in the early stages of many infections when bees from a previously uninfected colony rob out an infected hive.) How can the disease spread or be eliminated? After a young larva, less than about 2 days old, has eaten spores of the AFB causing bacterium *Bacillus larvae* the spores germinate in the larva's gut and turn into the non-infective, but multiplying, rod state of the bacterium. The rods divide often and so multiply greatly, eventually killing the immature bee soon after the cell is capped in either the late larval (pre-pupal) or early pupal stage. Within a few more days the rods turn into spores which will infect larvae in other cells if carried there by the workers. One infected larva results in several billion spores being produced yet only about 35 spores are enough to infect a one day old larva. This disease, therefore, has a great potential for spreading within a colony.



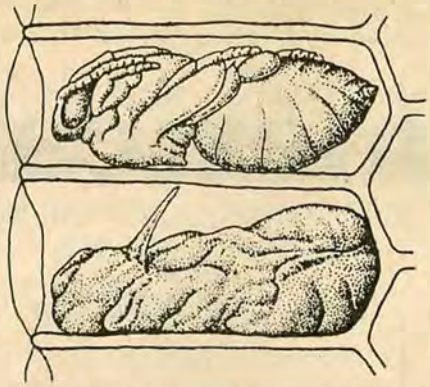
However, in some colonies of bees, the workers very rapidly uncap the cells containing dead brood, which is then disposed of outside the hive where it is very unlikely to contact bees again. This is referred to as "hygienic" behavior. In the extreme, dead brood is removed before AFB spores are formed. Efficient hygienic behavior probably enables colonies with a few cells of diseased brood to completely rid themselves of AFB, provided that there ar no AFB "scales" lodged in the hive. Antibiotic drugs such as Terramycin help control AFB because they kill the rods so preventing multiplication; however, drugs do not kill the spores.

If the dead brood is not removed from the cell it turns into a semi-liquid brown mass, eventually drying down into a flat scale which adheres tightly to the lower cell wall. The scale is difficult for the bees to remove from the cell wall and can provide a continuous source of spores to infect subsequent larvae reared in that cell. In addition, when an adult worker bee that has been cleaning the cell starts to feed a young larva the infection may be spread to new cells.

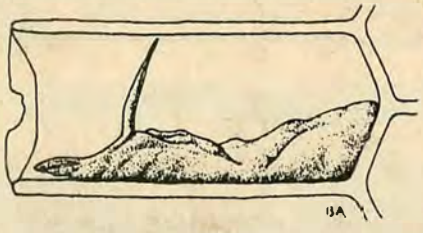
In some colonies workers will chew down the cell walls or patches of comb containing scales and then rebuild them with fresh wax. This can eliminate sources of further infection, although the debris produced contains spores, which may be introduced into other cells, particularly cells below those being chewed out.



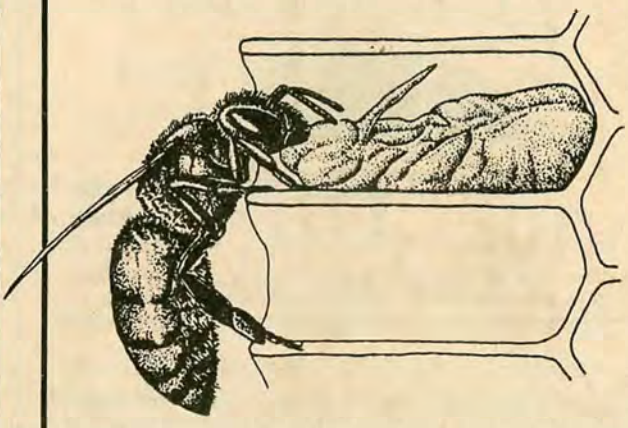
4) The cell-cleaner bee becomes a nurse and adds AFB spores to the food of a young larva.



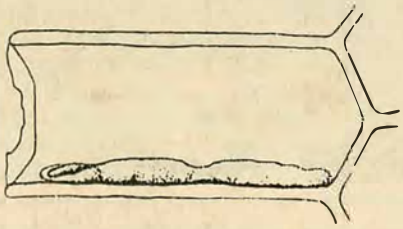
5) The infected immature bee dies soon after the cell is capped in either the larval or, as shown here, pupal stage.



7) The dead bee forms a semi-liquid mass (note sunken cap).



6) "Hygienic" worker bees may rapidly uncap and remove the dead brood before AFB spores are found.



8) A few weeks after the bee dies only a dried down AFB scale remains. The scale contains billions of spores (note sunken, and often perforated, cap).

Many of the tasks mentioned above are performed by worker bees by using their mouthparts. This must often result in contamination of the mouth and stomach by AFB spores. However, honey bees have a special organ (known as the proventricular valve) which effectively filters spores and other small particles out of the honey stomach and passes them into the lower intestine. Once in the lower intestine the spores cannot be passed on because the bees defecate outside the hive, and are harmless to adult bees.Δ

Reference

Bailey, L. (1981) *Honey Bee Pathology,* Academic Press.

Miner Institute

Continued from Page 197

The William H. Miner Agricultural Research Institute is a non-profit educational institution, which offers undergraduate students studies on the environmental sciences, farm management and in-vitro cell biology. Adaptive research and demonstrations as well as continuing education are carried out in cooperation with the State University of New York at Plattsburgh, the University of Vermont, Cornell University, local farmers and farm organizations, and agribusiness throughout northern New York. To support these programs the farm and forest lands, animal herds, classrooms, facilities, dorms, food services and equipment are used by both students and university professors.

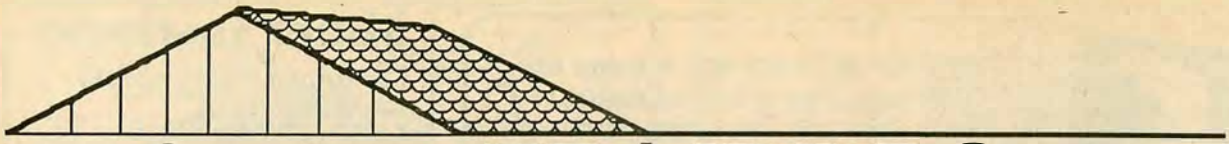
One of the oldest and most successful continuing education programs at Miner Institute is the apiculture program. The Institute owns its own colonies and uses them effectively in an apicultural education and outreach program. The highlight is a beekeeping seminar held at the Institute each April. The seminar consists of lectures, demonstrations, and workshops.

For the past two years the Institute has offered, through its outreach education program, a curriculum that brings apiculture into elementary school classrooms through "Let's Buzz the Schools".

The Institute supports many different beekeeping organizations such as the Empire State Honey Producers, the Eastern Apicultural Society and the Champlain Valley Beekeepers' Association. Their support includes secretarial services, facilities, equipment and supplies. This year the Empire State Honey Producers' Summer Meeting will be hosted by the Institute in July.

In recent years the apicultural program has developed to the point where it is the focus of apiculture activities for nearly all of Northern New York.

If you are vacationing in our area and would like to visit, the Institute is open Monday through Friday from 8:00 a.m. until 4:30 p.m. Individual as well as group tours are available.Δ



HOME HARMONY

By ANN HARMAN
6511 Griffith Road
Laytonsville, MD 20879

Have you ever looked at a recipe and said, "No way! That combination of ingredients just cannot come out the way the recipe claims". Unfortunately, many times we don't even give that recipe a fair trial. Fortunately, I did give the following recipe a try. (Yes, I muttered "No way!" as I assembled the ingredients.)

First, a bit of background. With certain food I am hopelessly traditional and somewhat fussy. I make pie crust from scratch, using flour, salt, *lard*, and cold water. The crust consistently turns out tender and flakey and golden brown — just right! But since I also love to experiment, I tried this pie crust recipe. Well, I was the one fooled — it is superb pie crust, on a par with my old-fashioned one! And it *does* keep in the refrigerator and it *does* freeze very well. Since this crust is so easily made — and it uses honey — please try it. I am using it all the time now.

Pie Crust

4 cups unsifted flour
1 tablespoon honey
2 teaspoons salt
1-3/4 cup Crisco (NOT oil, lard, butter or margarine)
1 tablespoon white or cider vinegar
1 large egg
1/2 cup water

Mix flour and salt. Add shortening and mix with fork until crumbly. In a small separate bowl, beat together water, vinegar, honey and egg. Pour into dry ingredients and stir until all ingredients are moistened. Divide into 4 portions. Shape into patties ready for rolling. Wrap in plastic wrap and chill at least 1/2 hour. This dough will keep up to 3 days in the refrigerator or it can be frozen. Makes 4 good size (9-1/2 - 10 inch) pies.

Now that the pie crust is ready, you need to put something into it. I will not give you a recipe for apple pie since you can just substitute honey for sugar in your favorite recipe.

Mile High Banana Pie

3 bananas
3 egg whites, stiffly beaten
4 tablespoons cornstarch
3/4 cup honey
2 cups boiling water
1 teaspoon vanilla
1/2 pint whipping cream
9 inch pie shell, baked

Slice the bananas into a cooled 9-inch pie shell. Beat the egg whites until very stiff and set aside. In a medium-sized saucepan stir together the cornstarch, honey and boiling water. Cook until the mixture thickens, stirring constantly. Remove from heat and stir in vanilla. Now pour the hot mixture over the stiffly-beaten egg whites and beat at the highest speed with electric mixer for about 10 minutes or until stiff. Pour over bananas. Beat the whipping cream until thick and spread on top of the pie. If desired, you can garnish with slivered almonds. Chill for several hours before serving.

Joy With Honey
Doris Mech

Now for the next April Fool story and recipe. Since I love the flavor, and aroma, of cardamom, I decided to try this spice cookie recipe. The instructions, as originally written, were accurate and told *what* to do, but not why to do it. I followed the directions and had a batter as thin as water — for rolled cookies??? "No way!" Happily I followed the simple instruction "let stand overnight". Was I fooled! The next morning the dough was the perfect consistency for rolled cookies. Do try this odd-sounding recipe. It has won prizes at honey cookery shows.

Spice Cookies

1 cup honey
1/4 cup butter
1/3 cup chopped pecans
grated rind of 1 lemon
1/2 teaspoon ground cloves
1/2 teaspoon ground cardamom seed
2-1/4 cups flour
2 teaspoons baking powder

Heat the honey and butter together for about 5 minutes. Add remaining ingredients except the baking powder and mix thoroughly. Partially cool, then sift in the baking powder and mix again. The batter will be very thin. Let stand at room temperature overnight. The batter will then be very thick. Roll out thin on a floured surface. Cut into desired shapes. Place on greased baking sheet. The cookies can be decorated with bits of citron and almond halves. Bake at 350°F for about 8 to 10 minutes or until lightly browned.

Nature's Golden Treasure Honey Cookbook, Joe M. Parkhill

Some recipes have an unlikely combination of ingredients. I could not wait to try this next recipe. The cookbook promised "Absolutely delicious — very tender", and so, indeed, these pancakes are just that. The batter is so quickly made that you can have a delicious breakfast even if you are in a hurry. Try them soon.

Seattle Pancakes

4 eggs
1 cup sour cream
1 cup cottage cheese
1 cup unbleached flour (or regular white flour
3 to 5 teaspoons honey

Mix thoroughly in a blender. Cook on a lightly greased medium-hot frying pan or griddle. Serve with Honey Lemon Syrup. Makes 8 to 10 pancakes.

Honey Lemon Syrup

1/4 cup honey
1 tablespoon lemon juice

Combine and cook until heated through.

A Honey of a Cookbook, Vol.ii
Alberta Beekeepers Association

This next recipe produces rich and delicious whole wheat bread. You may wish to consider this recipe if you are going to enter a honey cookery show.

Cream and Honey Whole Wheat Bread

1-1/2 tablespoons dry yeast
1/2 cup warm water
1/2 teaspoon honey
1 cup heavy cream, room temp.
1/3 - 1/2 cup honey
2 eggs
2 teaspoons salt
5 c. stone-ground wh. wheat flour

In a large mixing bowl, dissolve the yeast in the warm water with the 1/2 teaspoon honey. Let it sit until frothing. Add the cream, honey, eggs and salt and beat well. Add 2 cups of the flour and beat with an electric mixer 2 minutes or at least 200 strokes by hand. If time permits, cover the bowl and let the sponge sit for an hour or two, until noticeably swollen. Stir it down and gradually add more flour, until the dough pulls away from the sides of the bowl. Turn the dough out onto a floured board and knead until smooth and elastic, sprinkling with a little more flour if it remains too sticky. Do not add too much flour or the loaf will be dry. Put dough in a buttered bowl, brush top with melted butter, cover with a damp towel and let rise until doubled in bulk. Punch dough down, turn it out onto the board, knead a few times to press out air bubbles, cut in half, cover with towel and let it rest for 10 - 15 minutes. Grease 2 medium loaf pans. Shape the dough into loaves and put it into the pans. Brush the tops with melted butter, cover and let rise again until almost doubled in size. Bake in 350°F oven for about 30 minutes or until the bottom sounds hollow when tapped. For a tender crust, brush the tops with melted butter when you take them from the oven. Cool on rack. Makes 2 loaves.

The Garden Way Bread Book,
by Ellen Foscue Johnson

Pieces of freshly-baked bread, well covered with butter, accompanied by a salad and a soup make a lunch fit for a king. The dressing for this salad can be made well in advance of the meal.

Honey - Cherry Coleslaw

1 egg, well beaten
1/4 cup orange juice
1/2 cup honey
3 tablespoons light cream
dash of salt
8-ounce jar drained, red mar. cherries
4 cups shredded cabbage

Combine egg, orange juice and honey in top of double boiler. Cook over hot water until thickened, stirring occasionally. Cool. Add cream, salt and cherries. Blend well. Chill. Toss with shredded cabbage and serve.

Nebraska's Honey Cookbook
Nebraska State Honey Prod. Assn.

Every so often it is worthwhile to stop being in a hurry and to prepare something elegant for dinner without having guests for an excuse. Since roasting chickens are easy to find in supermarkets, you might appreciate this recipe.

Apricot Glazed Chicken

1 roasting chicken
seedless green grapes
4 tablespoons honey
1 can (16 ounce) apricot halves
1/4 cup butter or margarine, melted
2 teaspoons seasoned salt
1/4 teaspoon pepper
1/2 cup dry white wine

Stuff chicken with 1 cup seedless grapes that have been tossed with 2 tablespoons honey. Tie legs and fold wing tips back. Place chicken, breast side up, on a rack in shallow roasting pan. Drain apricot halves, reserving syrup. Set aside 6 halves for garnish. Whirl remaining apricots in blender with melted butter, seasoned salt and pepper and remaining 2 tablespoons of honey. Brush over chicken. Pour wine and 1/4 cup apricot syrup in bottom of pan. Cover chicken loosely with foil tent. Roast at 325°F for 2-1/2 to 3 hours or until chicken is tender. Baste occasionally with pan drippings to glaze. Remove foil during last 30 minutes of roasting. Serve chicken on platter garnished with clusters of green grapes and apricot halves.

Honey . . . Any Time
California Honey Advisory Board

No foolin' — these recipes do work and are so good to eat! Δ

APISTAN STRIPS TO COLLAR BEE MITE

An Interview with C. W. St. John, Manager of New Business Development and Acquisitions - Zoecon Corp.

A new product is available through Zoecon Corporation of Dallas, to collar the deadly Asian mite attacking U.S. honey bees and threatening the domestic honey industry. The *Varroa jacobsoni* mite has shown, in other countries, that it can spread like a brush fire on a dry day. The mite was first discovered in the United States in Saukville, Wisconsin, on September 25, 1987, and has since been found in 10 other states, including FL, NY, ME, PA, OH, MI, IL, SD, MS and NE.

APISTAN, a plastic strip impregnated with the chemical fluvalinate, became available on March 4 to beekeepers whose apiaries are infested with the fast-spreading Varroa mite. With APISTAN Strips, the Varroa mite control process is relatively simple, inexpensive and completely harmless to the bee. Zoecon Corporation, an insect-control and animal-health -care product developer, in conjunction with Sandoz Ltd., brought the product to market in March after receiving special government permission to make it available to the industry. APISTAN Strips were developed specifically to control *Varroa jacobsoni*.

In January, the Environmental Protection Agency (EPA) approved a special Quarantine Exemption requested by the USDA for the use of APISTAN Strips.

The mite, which can be seen with the naked eye, is about the size of a pinhead, with eight legs, a hairy reddish brown body and a two-pronged tongue. The mite attacks both adult bees and bee larvae in the brood cells. Once inside the hive, the mite attaches to adult bees and larvae with sharp legs and sucks the blood of the bees with its tongue. The mites can cut a bee's life in half and can kill or prevent an immature bee from developing into a healthy adult. The mite moves from bee to bee through close contact.

"This was a unique research and development effort due to the sensitive nature of the honey bee. We had to develop a product that would kill a mite on an insect without affecting the bee or the honey," explained C. W. St. John, Manager of New Business Development and Acquisitions for Zoecon Corporation.

"The Varroa has proven itself very resilient by developing resistance to several different pesticides," said St. John. "Dozens of different remedies have been tested to control this highly threatening parasite. Of all of these, APISTAN Strips have shown the greatest promise."

Fluvalinate is a synthetic pyrethroid, a chemical compound that imitates a natural insecticide produced by plants. Like the pyrethrum extract found in plants, synthetic pyrethroids such as fluvalinate have a low toxicity to mammals. It does not pose a serious problem to man or bees and, if handled correctly, will have no effect on the honey.

> The use of APISTAN Strips will be controlled by guidelines to be established by USDA and state regulatory agencies. To cooperate with the regulatory agencies, Zoecon has agreed to supply the names, addresses and quantity purchased of all purchasers of the product.

Three varieties of APISTAN Strips have been developed by Zoecon. The first is the APISTAN Strip, a clear, 10-inch long plastic strip that contains 10% fluvalinate and hangs vertically inside the beehive. Two strips per brood chamber are recommended. One strip is hung between frames three and four and the second between frames seven and eight; in effect, dividing the brood chamber into thirds. The APISTAN Strips can be attached to frames with a thumb tack, staple, or any suitable hanging device.

The second product has been designed for bees packaged for shipment. This is the APISTAN Package Strip. St. John says, "As I understand it, the final word isn't in yet on the exact treatment recommendation for packages, as this is still being looked at."

The third product is the APISTAN Queen Tab. The tabs are small enough to be laid on the bottom of a queen cage and are impregnated with 1% fluvalinate. The queen and her attendants will be mite-free within three days.

"Before the Package Strip and Queen Tabs will be made available to beekeepers, an amendment to the Quarantine Exemption must be approved by EPA," says St. John.

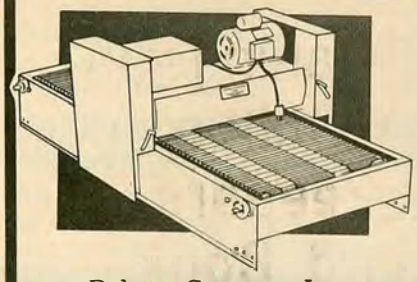
There is a mite detection process which enables inspectors and beekeepers to periodically check their colonies for mites. The process involves placing white sticky paper on the bottom of the brood chamber, sticky side up. Position the APISTAN Strips in the hive for seven days. After a week, check the white paper. If your bees are infested, you will be able to see the dead mites on the paper, since they are visible to the naked eye.

"Detection using APISTAN Strips is more reliable than other methods for detection," says St. John, "some of which require destruction of several hundred bees. The use of APISTAN Strips does not require killing bees and has the benefit of sampling the entire colony." St. John goes on, "Once the APISTAN Strips have been placed in either hives or cages, APISTAN begins its job. The bees come in contact with the strip as they move around and receive a small application of fluvalinate. Through cleaning themselves and mingling with other bees in the hive, the miticide is spread throughout the colony and begins controlling the mites."

"Prior to the development work which began in October, APISTAN Strips had been tested in Israel, France, Spain and Germany to control Varroa," said St. John.

Hobbyists will be encouraged to use APISTAN Strips, along with other control methods, if their bees are found to have Varroa. Robert Mungari, an agricultural entomologist with the New York State Department of Agriculture and Markets, said hobbyists' colonies are also susceptible to infestation. "Many hobbyists won't recognize Varroa until it's too late. We're relying on the commercial beekeepers to pick up the slack," Mungari said. However, he urged hobbyists to get information about Varroa mite and have their bees surveyed.Δ

New Product



Dakota Gunness, Inc., announces their new 200 Model Uncapper. Unlike many uncappers, this unit removes cappings while the frame is horizontal rather than vertical. Using chain flails, both sides of a frame are uncapped simultaneously. This system eliminates problems with sunken areas, and does not damage frame parts.

The unit will handle 3 shallow or modified frames, or 2 deep frames at once. Built of sturdy stainless steel, the unit is equipped with 2 motors (one for the belt and one for the flails).

For information write Dakota Gunness, Inc., Box 106G, Abercrombie ND 58001.

POLLINATION PRIMER

KATHY and ROGER HULTGREN
155 Lovell Road Holden, Mass 01520

Proper plant pollination has been a concern of man since the time of Babylonia. The Hebrews and Babylonians had an annual pollination ceremony for their date-palm trees. When the date-palm bloomed, they would shake male flowering branches over the flowering female trees. This was their way of assuring that the date crop would be abundant.

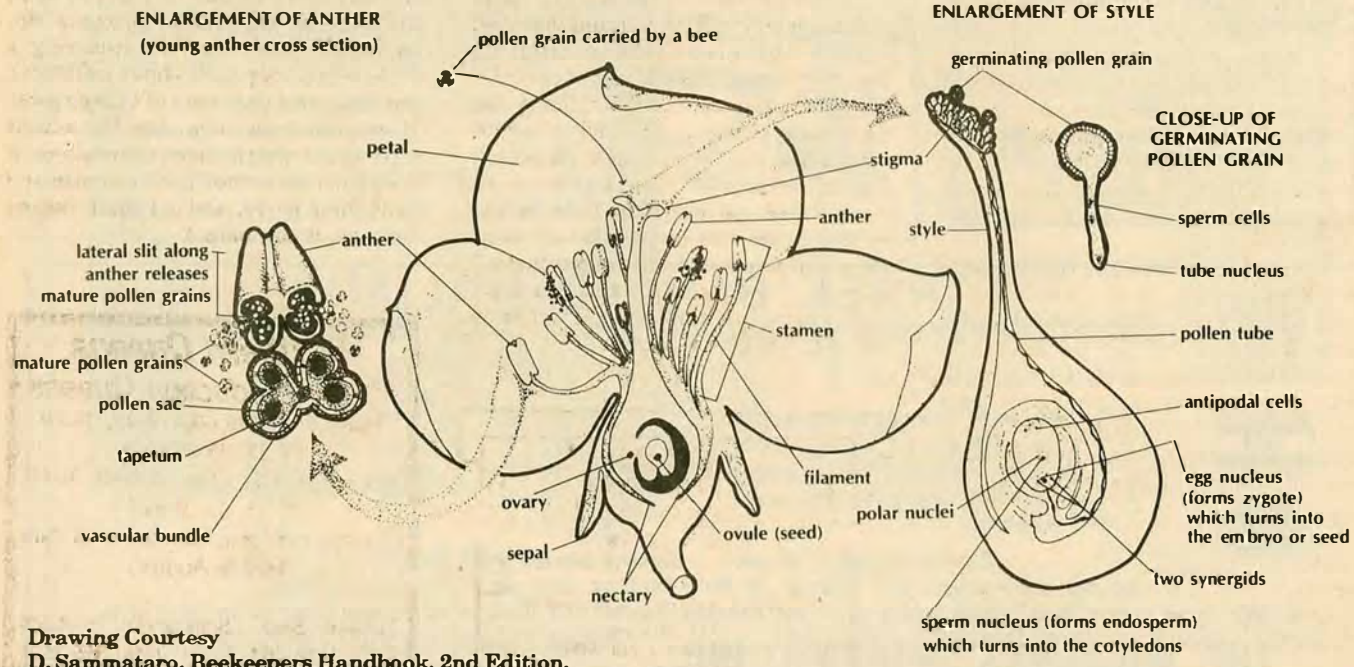
Man has recognized there are many ways nature fulfills pollination. There are plants pollinated by wind, insects, animals, water, by themselves, and if all else fails, by man, who employs artificial pollination.

Before examining the various types of pollination lets explore the four main parts of a flower — the sepals, petals, stamens and pistils. Sepals are often green-appearing leaves, located on the outer portion of a flower bud. Just above the sepals are the petals. The petals are usually flat in appearance and can be nearly any color. The stamen is the male part of a flower, comprised of the filament and the anther, which produces pollen grains. The female part of a flower is called the pistil, the components are the stigma, style and ovary. Contained within the ovary are the ovules, which house the embryo sac or the young plant. Pollen must land on receptive stigmas for fertilization to take place. Each flowering plant has it's own distinct pollen grain shape, observable under a microscope. The sepals, petals, stamens and pistils are also unique to each species of plant.

Pollination occurs basically two ways — cross-pollination or self-pollination. Cross-pollination occurs when pollen from one flower reaches *another flower in the same species* . Self-pollination refers to the transfer of pollen from the anther to the stigma *of the same flower*. There are plants, such as the begonia, which have separate stamens and pistillates located on the same flower but their blooming and maturing are not coincided. Therefore, cross-pollination is still needed in order for these plants to propagate. There are many modifications of these methods, but these are primary.

Continued on Next Page

The Fertilization of a Flower



Drawing Courtesy
D. Sammataro, Beekeepers Handbook, 2nd Edition.

Let's examine specific signs to notice when determining the type of pollination required by plants. Wind pollinated plants usually have small, inconspicuous flowers which bloom in early spring. The anthers and stigmas of these flowers are extended, freely exposed to the wind. Pollen is produced in abundant quantities by these plants. The wind easily picks up the pollen, however, only a small percentage ever reaches the targeted stigma of an awaiting plant. This is the reason why wind pollinated plants produce an over abundance of pollen. The majority of the pollen is transported only a few hundred feet. Nature has compensated for this by creating large fuzzy or branched stigmas on the pistils of these plants. This increases the surface area on which pollen can land and still be effective. These flowers are usually unattractive and may be the source for hay fever in man. An excellent example of wind pollination is the oak. In early spring, an oak will sprout one or a few pistillate flowers near a new leaf. These hang limply and are easily moved by the smallest breeze.

Animals and insects visit flowers to obtain food, lay eggs or to find a mate. Plants which are visited by animals and insects produce nectar, which is housed at the base of the flower. In order to obtain nectar, the pollinator must brush against the anthers or stigmas. Not all visits achieve pollination. For example, honey bees will occasionally get nectar from flowers such as alfalfa, which has a deep flower tube, by going through the side of the tube. This is possible because other insects have previously made a hole in the tube.

Insect-pollinated flowers are often brightly colored and have nectar guides directing the pollinator to the nectar. On 'butter and eggs', the nectar guides are the orange spots, on 'violets' the lines direct insects to the nectar, while the entire face of a pansy is the guide.

An odor produced by the nectar is another guiding force. When pollen and nectar are mature, this odor also attracts pollinators. These plants produce less pollen than most wind pollinated plants. When the pollinator brushes against the pollen it adheres to fur, feathers or hair and is transported to the next flower.

Let's look at those features in flowers that give clues to what animal or insect will carry out pollination. Through research we have learned

Continued on Page 233

'Down Under' — *Continued from Page 203.*

MATING NUCS

"I brought the idea for my mating nucs back from the States, based on the ones Homer Parks uses. We have 4's but I find the double units work best here. We work them on a 15-day cycle, compared with a 20-day cycle for conventional nucs. The smaller the unit, the quicker the queen mates, but this is not always necessarily a better mated queen."

"I also have some polystyrene mating nucs that we work on about a 12-day cycle. They run on one shake of bees and a queen cell, and a bit of foundation on bars that the bees draw down . . . no frames. I put dry sugar and syrup in the feeding compartment, then put the bees and queen cell in the nuc and into a cool room for a day or so until the virgin comes out. They're just like the 'baby nucs' in California."

"The first year I had these, I bought them for $6 each and had to put one queen through to cover my cost at that stage. I got 16 cycles through them in that season! I've never got quite that many again, but if they're going well and the bees stay, they work quite well. Their main problem is that they are not self-supporting and the bees often abscond."

"With these small nucs you can shake from hives that have overwintered well and early in the spring you can pop a queen cell in them and get some really early queens."

"We can't get Dri-vert sugar here, although we could buy liquid inverted sugar from the North Island. Shipping the stuff across Cook Strait is prohibitively expensive, though. Mostly we use crude raw sugar, which is white cane sugar that hasn't been bleached. For cell-raising it's great and seems to work better in a syrup than white sugar. It absorbs quite a bit of moisture, so a scoop of the dry sugar is good in nucs. It's dark stuff, and you can't feed it prior to a honey flow if you have white honeys, or it shows."

QUEEN CAGES

"We use plastic queen cages because wood is too expensive. Plastic costs us 18¢ all ready to go, whereas it costs me 20¢ just for the wood without the wire gauze or anything else on it. By the time we've cut the gauze and filled the cage with candy, it's just too expensive. Within our operation, we can use the plastic cages over and over again. They're quite versatile, and are especially good for banking cages because the bees can feed from either side in the frame. The sliding matchbox-type arrangement makes them quicker and easier to use. To load the cage, you just put your thumb over it and run the cage up the frame, whereas with the wooden cages you have to count the bees in one by one. The plastic cages are also easier to put the candy in. The beekeeper I used to work for in New Zealand actually made and designed these cages. I showed them to California queen breeders in 1970 but no one was interested. They wanted the wooden ones because that's what they're used to."

"We sent away about 2,000 queens this year to France and Canada. The Canadian market has been there for years. I started sending queens to Canada in 1975, but there's no doubt that the market is growing now because of what's happening in California and what's coming up from Mexico shortly. We're starting to prepare for it, but I don't think it's going to be as brilliant as all these optimists are saying. I think they're dreaming a little when they talk about unlimited markets and that sort of carrying-on. It remains to be seen. The Canadians have to get queens from somewhere. If they can overwinter their colonies and split them early, and get their queens from us, it can help.Δ

Plant Pollination By Honey Bees

DR. JAMES TEW • The Agricultural Technical Institute • Wooster, OH 44691

"Who is doing What, and Where."

Pollination has always been one of those necessary beekeeping topics to which all good beekeeping texts gave coverage. Unless you are a special kind of person, pollination practices may be a bit difficult to find exciting. I have found in my years of pollination experiences with honey bees and apples that a sun-burned face and a stiff neck (from peering up into the tree canopy) are guaranteed. A radio turned up loud may help with the quietness of a spring afternoon, but in general, you are on your own. I realize that nothing can replace a beautiful early spring day, but after a while one would rather sit beneath the apple trees and casually observe what the bees are doing. It becomes work when I am required to do the observing. However, this type of research is important — after all, this is what the US Agricultural system can't survive without. We have read that bit of information time and time again. It's true, but one has to admit that when compared to hiving a swarm, installing a package, worrying about Africanized bees, going to state meetings, or making decisions concerning Varroa, pollination just seems to fade. I can say all this with impunity. Most of my degree work was concerning pollination procedures.

With so much hoopla about mites and Africanized bees, seemingly little publication time has been given to the job that honey bees do best — plant pollination. Believe it or not, pollination research has gone on during this period of concern about other beekeeping problems.

From October 1, 1983 till September 30, 1988, the Tuskegee University has been conducting a study on the "Breeding and Evaluation of Fruits for Small Farm Enterprises". Their stated objectives were: To evaluate cultural practices interaction for small fruits, to develop blueberry cultivars with superior characteristics, to develop a wild blueberry nursery and develop an alternative site preparation for plantings. Additionally, work is being done on grapes. The efforts there are to develop grape cultivars with improved viticultural characteristics and evaluate superior grape cultivars for high quality wines, to evaluate diseases on growth and development of fruit crops, to determine pollination requirements of horticultural crops by honey bees, to evaluate production of honey, wax and pollen from bee colonies, to determine market acceptance, market growth and market potential of bee pollen. M. A. Wilson, M. Burns and C. Bonsi at Tuskegee University are the researchers doing the study.

"Research is ongoing, and we continue to learn."

M. D. Levin, G. M. Loper and Y. Lensky, working at the Carl Hayden Bee Research Center, Tucson, Arizona performed studies for three years (1984 - 1987) to determine plant factors that affect attractiveness of onion and cucumber flowers to honey bee pollinators and develop principles and methods for using knowledge to improve pollination of hybrid seed crops.

G. D. Waller, G. M. Loper and S. L. Buchmann, all from the Carl Hayden Bee Research Center are working on a project that is being conducted from March, 1986 - January, 1990. They have been studying the impact of the Africanized honey bee on pollination. The objectives of the project are: to investigate the pollination efficacy of the Africanized honey bee relative to the European honey bee using agricultural crops and determine what changes in honey bee management techniques may be required in areas where Africanized honey bees predominate in the wild.

D. M. Caron is working on a very practical pollination subject — watermelon pollination. Dr. Caron hopes to determine the flower visitation behavior of the honey bee and identify other major pollinators of watermelon. Additionally, the pollination requirements of watermelon and the requirements for fruit quality and set are being evaluated. The dates of this study are September, 1985 - September, 1988.

Many other projects have, and are being conducted, on various aspects of pollination. I think that those listed above offer an idea of the diversity of the work that is in place.

A major problem with pollination studies and the subsequent "selling" of the value of honey bee pollination is the difficulty in placing a monetary value on the process. I distinctly remember being uncomfortable several years ago when an orchard owner asked me, "How much more money will I make by placing two colonies per acre instead of one?" This guy really didn't care about the problems with weather, plant/pollinator interactions, or colony conditions; he just wanted a simple question answered. I could not give an acceptable answer — at best, only a guess. Studies that are attempting to answer these questions are being conducted by various agencies within the federal government. The process will be difficult and the results (no doubt) challenged by some, but even so, there has to be an estimate placed on the value of bees to our agricultural system and to our society. I wish those who try the best of luck.Δ

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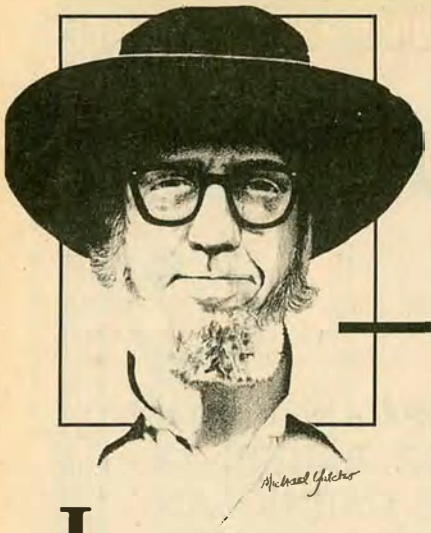


BEE TALK

RICHARD TAYLOR • R. D. 3 • Trumansburg, NY 14886

"Do-it-yourself Solar Wax Melters"

I've been writing these bee talks for seventeen or eighteen years now, and I don't recall ever talking about solar extractors. Perhaps some reader is going to point out now that I did talk about them, and not too long ago, providing once again that I am getting old and my memory is starting to lag. There is not much I can do about that.

And now to the subject at hand. You can, of course, buy a dandy solar wax extractor from a bee supply catalog, but you can also make one yourself, in just a few minutes, that will work just as well. Mine is nothing but an old bee hive painted black, inside and out, with a scrap of plywood nailed to the bottom. I bent a piece of sheet metal into a trough to go inside the box and hold the wax scraps. I painted that black, too, although most of the black paint has worn off by now. And on top I laid a piece of glass. The glass broke a couple of years ago, but that hasn't made any difference. I just lay the two pieces on, one at a time, and slide them together. Maybe this summer I'll pick up a new pice of glass if I think of it. Anyway, that's about all there is to my solar wax extractor, and you'd be surprised how much beautiful beeswax I get processed through the thing.

The wax melter has to be tipped up, to catch the heat of the sun, and to provide a slope so the wax can run down the trough as it melts. I just prop mine up with a brick or two. Now that trough should narrow down to sort of a neck, so that the melted wax will flow out in a nice little stream or drizzle, instead of just drizzling all along the edge and missing the wax mold. That is easy enough to arrange. Just bend the bottom edge of the trough up a bit, except at the center, so as to direct the flow of wax to where you want it. I also stuck a piece of hardware cloth there, to hold back any slumgum or chunks of wax that are not quite melted.

That's all you need for a wax melter. I use cottage cheese cartons and that sort of thing for wax molds. That way you can just peel it off, after the wax is hard. On a good warm day, I end up with maybe a quart container of nice wax, but about half that is more usual. That's enough for me. I melt up all the wax scraps I have, which is all that matters. Since I just produce comb honey, I don't have any cappings to melt. All I have are scraps from here and there, but it is astonishing how it all adds up. I have more than enough beeswax to keep me supplied with foundation. And it costs me nothing at all to melt it down. I step out into the yard after breakfast, remove the block of wax from the previous day's melting, throw in wax scraps for the day just beginning, and that's it.

Old brood combs are a little messier, but you can deal with these in a solar extractor, too. You just have to keep the slumgum cleaned off the trough. I use leftover chunks of that for starting the fires in my coal and wood stoves and fireplace in winter.

You can make a fancier solar extractor, of course. For instance, you can have a double pane of glass. I raised the question some time ago whether two panes are better than one, and got a variety of answers. The late Edwin J. Anderson did some precise experiments with solar extractors, proving to his own satisfaction that you get more heat with a double pane. But my friend Virgil Tongish, out in Ohio, who was in the window business for thirty years, told me a single pane would be better. He explained this in terms of "R factors", which I didn't understand at all. Others wrote with a similar diversity of opinions. But then I got to thinking, what difference does it make? Maybe a double pane would make a hotter melter, maybe not. The fact remains that even my single piece of broken glass works just fine, and what more do you need to know?

I did pick up from someone another good idea, though, and that is that you can cut the side off of an old plastic five-gallon bucket to make the trough with. A good pair of tin snips would do the job, and you could cut it down to just the size you want.

I like the idea of using the heat of the sun to get something done. It's very cheap, and somehow I think that this is the way things should go. Make use of what is at hand, keep everything simple, and rejoice in God's gifts. I can't really say that I've gotten much richer each morning when I drop a new block of beeswax into my wax bin, but I somehow feel richer, and that should count for something.Δ

Pollination Primer

Continued from Page 229

that bees can distinguish the colors of blue, yellow, blue-green and ultraviolet. Interestingly, nature has endowed most of the bee flower plants with yellow centered flowers and petals which are blue, yellow, blue-green or ultraviolet. One would therefore expect a red poppy to be ignored by a bee. While red is not among the colors seen by a bee, this particular flower reflects ultraviolet light which attracts honey bees.

There is usually a landing platform for the bee, who extends her proboscis (tongue) into the nectar. As she is sucking the nectar, the bee's head, back or underside brushes against and receives pollen from nearby anthers. Since the bee practices flower fidelity (visiting only one species of flower on a trip), the stigma on the next flower she visits will receive this collected pollen.

The wasp is another insect which carries out pollination as it seeks food, a place to lay it's eggs or to find am ate. It commonly seeks out drab colored flowers such as many of the European wild flowers. These flowers generally have a small, bowl-shaped depression which holds nectar. The wasp clings to the flower's labellum (the lowest petal of the flower) and drinks the nectar. As the wasp is drinking, its' head bumps against the stigma and anther, and pollen attaches to it. The head is the only place pollen is able to attach because the rest of a wasp's body is hairless. When the wasp goes to the next flower, it presses against the stigma as it is drinking and the pollen is passed along.

Butterflies and moths have a long, slender proboscis (tongue), able to probe deep into flowers with narrow, tubular corollas or petals. As the butterfly feeds, pollen is collected on the sides of her long proboscis or the main part of her body. When finished, she recoils her tongue until she visits the next flower. The collected pollen is deposited as the proboscis is again uncoiled. Butterflies are active during the day and are able to see several bright colors. Their sense of smell is not as developed as the bees, so flower color is their main nectar guide. These flowers provide the butterfly with a place to land and rest as they are feeding. Moths, on the other hand, are usually active during the evening, and flower color is less important. These flowers, such as the evening primrose, are open at night and are usually pale in color. The odor which is emitted by the nectar is the attracting and guiding force in these flowers. Moths prefer to hover while feeding and therefore have little need for a resting place on these flowers. Moths take nectar quickly and pause only briefly before moving along.

Birds that pollinate can be found in the warmer parts of Asia, Africa, Australia, New Zealand and the United States. The hummingbird is the only pollinating bird found throughout the U.S., while the white winged dove is prevalent only in the Southwest desert area. Birds are active by day and possess a keen sense of sight. Bird pollinated flowers are usually red and/or orange in color and produce an abundant amount of nectar. The flowers have little or no scent, and are nearly always tubular in shape. The visiting bird inserts a long tongue into the corolla (flower tube) to reach the nectar. Pollen attaches to the bird's feathers as the nectar is drunk and is transported to the next flower.

Bats, like moths, are active at night. Their flowers are drab or pale and emit a strong stale or mousy scent. The flowers of these plants protrude away from leaves and stems. As the abundant nectar is drunk, the pollen becomes stuck to the bat's fur, and is thus passed along.

As you can see, nature has provided her numerous plants with a multitude of ways to achieve the important process of pollination. In examining these, one can't help but marvel at the bee's important role in this process. With over 1/3 our diet depending on insect pollination the honey bee is responsible for approximately 80% of all commercial crop pollinization in the United States. It is clear, the honey bee plays an important role in the balance of nature.Δ

QUESTIONS?

Q. Are there any parts of the hive where you feel that plastic would be better than wood?

Paul R. Maust
Gibbon Glade, PA

A. No. my experience with plastic inner cover, bottom boards and the like has been unfavorable. They bend and warp. Properly treated wood lasts indefinitely.

Q. I have about 60 frames of partially drawn comb. In some the foundation is drawn out on one side but not on the other. Can these be given back to the bees next year to finish up for cut comb honey? Also, what about a frame that was only partly finished this year, and from which I have cut out the comb honey that was capped over, thus leaving an empty space in the comb. Can this be given back to the bees to repair and fill for cut comb honey?

Jim Totin
New Cumberland, PA

A. Yes, I have sometimes returned to the bees unfinished comb honey from the previous year, with satisfactory results, but I do not really recommend it, for the comb honey you get is likely to be waxy. I have also returned to the bees frames and comb honey sections from which honey had been cut, and they have filled them up okay, but again, the resulting honey is likely to be waxy. It is also essential that any such unfinished frames or sections be entirely free of honey from the previous year. This can be ensured by setting any supers with honey or traces of honey out near your apiary and letting the bees lick them bone dry. In general, however, I recommend starting with fresh, soft foundation each year when raising comb honey.

Q. What is the best way to establish a colony from a nuc so as to get as much honey as a regular hive?

Name withheld by request

A. Start with at least three combs of brood and bees with a laying queen. When you transfer these combs to a full-size hive, feed it sugar syrup until the foundation is drawn in all the frames. If the frames already have drawn combs, then feed them sugar syrup — perhaps a gallon to two — until they have honey stored in at least two of those combs.

Q. Do you ever feed your bees in spring with high protein for faster buildup?

Name withheld by request

A. I don't, because there are here, as in most places, ample sources of pollen in the spring. There is little need to pay money for what the bees can gather for themselves.

Q. How soon after an old queen has been removed should a new one be introduced?

J. A. Yoder
Millersburg, Ohio

A. There is no need to wait. If the new queen is introduced in a mailing cage then it will take one to three days for the bees to chew through the candy plug, and this is a sufficient lapse of time. A safer method is to introduce the queen with a nuc.

Q. A colony of bees I bought had been hived without foundation so the combs are a mess. I set on top of it a new hive fitted with frames and foundation and the bees have occupied this and built good combs. Now I need to know how to clear the bees out of the old hive below. If I put an escape board between the two will the bees pass up through it and eventually empty the old brood box?

Dick Seals
Beaverton, AL

A. No, that will not work. Bees will never abandon brood to pass through an escape device. The simplest way to solve the problem will be to wait until early spring, when the bottom story will probably be empty or nearly empty of brood and you can remove it, shaking out any bees that are there. Meanwhile, separate the two stories, before winter, by sliding the top half back an inch or so.

Q. Is it necessary to remove the attendant workers when introducing a new queen?

John C. Farley
Columbus, OH

A. Not if you are introducing the queen to a nuc or to a split that has been set on a new hive stand, for the young bees which remain with the brood will not make any trouble. But if you are introducing the queen to an established colony that will remain where it is, and thus with its population of older flying bees, you must remove the attendant workers first.

Q. What is the best way to remove the attendant workers from the mailing cage when you buy a new queen?

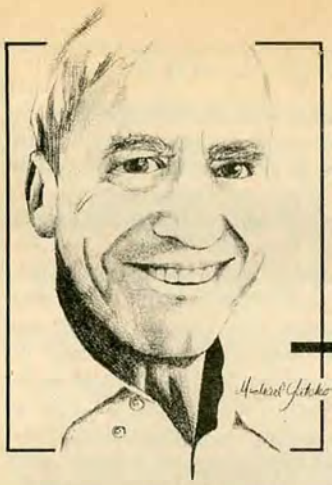
Duane Waid
Interlaken, NY

A. The best, quickest and simplest way was discovered by Mr. Edward Plawecki of Dearborn, Michigan. He lifts out the little staple holding the screen at one end, slips a piece of queen excluder under the screen, and then, holding the screen away, shakes out the workers; then, holding the screen back down with a finger, he slips out the excluder piece and replaces the little staple, (If you have trouble with that staple, a thumb tack or rubber band will work just as well.)

Questions are welcomed. Address them to Dr. Richard Taylor, 9374 Rt. 89, Trumansburg, NY 14886 and enclose a self-addressed, stamped envelope for a prompt reply.

& ANSWERS!

Richard Taylor



SIFTINGS

CHARLES MRAZ • Box 127 • Middlebury, VT 05753-0127

"Are bees really smart?"

When talking about bees, rarely does anyone discuss their intelligence. This is understandable since some entomologists, biologists and even beekeepers do not believe bees or other animals have intelligence. They are thought to do everything by instinct, stimulated by environmental conditions. If bees had no intelligence, and did everything by *Instinct*, they would all do everything the same, under the same conditions. They would be *consistent*.

Years ago, I believe it was Dr. C. C. Miller that said, "The only thing consistent about bees is their inconsistency." Certainly the best description of bees ever quoted. It depends on what you mean by "intelligence" in bees and animals. Intelligence means bees learn by experience. When bees are faced with conditions that can harm them, they must learn to solve these problems to survive.

If bees do have intelligence, are some smarter than others? When one works with bees long enough, you soon learn there are bees more intelligent than others. It is the smart bees that survive.

In the past, bees have been bred with the goal to produce large quantities of brood, under even the most adverse conditions. The idea was that the more bees — the more honey produced. That might be true during a honey flow.

Here in the North, where the honey flow usually ends in July, such bees will continue to raise brood, with no honey coming in, straight into winter. I have seen hives with 100 lbs. or more of surplus after the flow in July use every drop raising brood into winter. In Vermont these bees will not find honey in fields covered with snow. When their honey is gone, these colonies just freeze and die.

One could keep them alive if they were fed before honey was again available. I never could figure out how to make money with bees that ate more than they produced.

Intelligent bees are important for winter survival because they have the "sense" to conserve stores as soon as the honey flow stops. In spring they go to work and produce a lot of bees.

Intelligence is also important for bees to learn to handle adverse conditions, as well as their many enemies.

When the German Black bees were still around, many were helpless against wax moths. I've seen a hive with 5 frames of bees and queen in a hive body; and right next to these bees and brood were 5 frames, with a solid mass of wax worms. The bees made no effort to remove them. Some strains of Italians, with only three frames of bees and brood, will easily keep several hive bodies of comb free from wax moths.

Some years ago, when working in the Vera Cruz area of Mexico, we saw a 30 hive bee yard completely covered with immense spider webs. The webs were spun from palm trees, some as much as 25 feet apart. Not only did the webs completely cover the whole yard, but it was so thick it seemed impossible for bees to leave their hives.

I watched the bees to see what they did. Strangely, I did not see any bees trapped in the web, to be gobbled up by the big spiders. I did see some bees fly right through the web. There was a tunnel that could not be seen from the outside. Did those bees fly through the web by *instinct* or *intelligence*?

I have been collecting bee venom for almost 40 years. Years ago, a student of Dr. Halla Brown, George Washington University Hospital in Washington, D.C. tried to collect bee venom for Dr. Brown. He built a clever "electric shock" trap at the entrance of a hive. The idea was for the bee to get a shock as it left the hive and deposit some venom. Then it was supposed to go out, collect nectar and on the way back in, another shock and another collection of venom. With a stream of bees going in and out of the hive the student expected to easily collect all the bee venom Dr. Brown would need for her research.

But the student had not yet learned about bees. The first bee to get a shock immediately turned around, telling other bees that some dumb student was pulling a fast one on them. This stopped all traffic out of the hive. When it was turned on again, bee traffic again stopped instantly. No matter how he tried to fool the bees, by tricky variations in the on and off cycles, he did not fool the bees one bit. When the shocker was on, traffic stopped; when it was off, traffic resumed full speed. How did the bees know when the "hot foot" was off or when it was on? Instinct or intelligence?

Intelligence is an important factor in the survival of bees against all kinds of adversity. Reports are that the Asian bees will attack and kill Varroa mites.

There seems to be hope for chemical control of mites, but they can be notorious for developing resistance to chemicals in about 3 years. So their useful span is short. What do we do after we run out of "safe" chemicals?

These bees, I believe, have learned to recognize and attack mites. To do this they must be aggressive because bees with no "protective instincts" will perhaps never learn to protect themselves against Varroa. the more intelligent the bees and the more aggressive the better.

Beekeepers have always demanded gentle, attractive bees. To develop such bees, intensive in-breeding is necessary, which occasionally reduces their vitality and intelligence.

We need to only look at highly inbred show dogs and other animals to see what in-breeding can do. Such animals are often lacking any brains.

Hint of the Month

Many of our native honeys will slowly granulate or crystallize if left standing in the cupboard. Actually, partially or completely granulated honey is easy to measure for cooking. However, you will want to store such honey in a wide-mouth jar for ease in spooning out.

But what if you want some honey to remain liquid? By far the *best* long-term *storage* place for honey is in the freezer. Fill your selected jars at extracting time. There is no need to leave expansion room in the jar since there is not enough water to create a problem of popped tops or broken jars. A 3 or 5 pound jar will take several hours to warm up enough to pour easily, but it will still be nice, liquid honey even after many months in the freezer.

The WORST place for honey storage is in the refrigerator. Honey that is taken in and out of the refrigerator will granulate faster than honey left on the kitchen table.

Honey for every day use should be kept at room temperature, handy to the stove and the toaster.Δ

Siftings, Cont'd.

If we are going to breed bees for resistance to enemies such as Varroa, we have to change our ideas about queens. They may not be as gentle as a house fly or golden—but rather a dirty brown, as they used to be.

I know many beekeepers may prefer to control mites with chemicals, but this can only lead to a dead end when we run out of chemicals. We must learn from Mother Nature. After all, Mother Nature has 30 million years of experience producing honey bees that have survived attacks from their enemies with no help from chemical companies, entomologists or beekeepers. They did it on their own. After all, perhaps bees are more "intelligent" than beekeepers, biologists and entomologists? Intelligence may be a more important factor in breeding than any of us realize.Δ

Answers to TESTING YOUR BEEKEEPING KNOWLEDGE

1. **False.** A three pound package of bees consists of approximately 10,500 workers and a mated queen caged separately. Normally the workers are not related to the queen. On the day the packages are to be made up, work crews move to the apiaries where they shake bees into funnels to fill the packages. Packages often contain bees from two or more colonies. A second crew goes to the queen mating yard where they begin caging queens from the mating nucs. These caged queens are added to the packages back at the warehouse and the packages are shipped the same day.
2. **True.** A nucleus colony or nuc is composed of bees in all stages of development, as well as food, a laying queen, and enough workers to cover from 3 to 5 combs. Packages are shipped without combs and brood; containing only adult bees and a mated queen.
3. **True.** An individual needs to decide what type of honey they are going to produce before they begin purchasing their equipment, especially frames and foundation. There are two basic types of comb foundation, distinguished by their relative thickness. Thin surplus foundation is used to produce section comb honey, chunk honey, or cut-comb honey. Thick or heavy foundation should be used in the brood chamber and in frames for producing extracted honey. Thicker foundations often are reinforced with vertical wires, thin sheets of plastic, metal edges or nylon threads.
4. **True.** Within a package, a young mated queen is housed in a separate cage that is suspended at the top of the package next to the feeder can. Queen cages are supplied with sugar candy as a food source and the workers are given a feeder can of sugar syrup.
5. **True.** Races in bees are like breeds in animals and varieties in plants. Being of the same species, these races can interbreed and produce viable offspring.
6. B) April - May
7. E) 50-60°F
8. Frames of capped brood should be added to packages when they are installed if available, since during the first 21 days after installation, a package bee colony experiences about a 35% loss in population. This loss occurs because workers require twenty-one days to develop from eggs, during which time the older bees of the population die. After this period, the rate of emergence of young workers begins to exceed the rate of death of older bees as the population grows. About four weeks after the installation, the population is completely restored. Adding capped brood will mean that new bees will begin emerging shortly after installation and the colony gets off to a faster start.
9. Package bees should be installed in late afternoon or early evening when there is little opportunity for flight or drifting between colonies. This allows the colonies to get settled before they actively start flying the following morning.
10. Prior to installation, a package is normally sprayed with water or sugar syrup so the bee's wings become wet. This greatly reduces bee flight and the mass of wet bees is easily dumped from the package into the hive.
11. A package should not be disturbed after it is installed for approximately 7 to 10 days except to feed the colony as it is needed and to remove the queen cage. Extensive hive manipulations or a large disturbance may cause the workers to ball their queen.
12. Suitable smoker fuels include burlap, corn cobs, wood shavings, pine needles, cardboard, punk wood, bark, sumac bobs, cotton rags, dry leaves, and bailer twine.
13. A beginner beekeeper should start with at least 2 colonies of honey bees because of the possibility of queen failure. Having more than one colony allows the beginner to take brood from a queen-right colony and salvage the colony in which the queen has failed. Also having more than one colony gives the new beekeeper a better sense of what to expect as colonies grow and develop, since colonies are rarely equal.
14. Nucleus colonies have many uses other than establishing new colonies. They are often used as mating nucs into which ripe queen cells are introduced, for holding or banking spare queens until they are needed and serve as a means by which a new queen can be introduced to a colony that is being requeened.
15. The advantages of starting a hive with a nucleus colony rather than a package are: the faster rate of development due to the presence of brood and no break in the queen's laying cycle; ease of establishing the unit in your own equipment; and the chance of seeing the unit before purchasing it. A nuc usually expands rapidly into a strong colony and has a better chance of producing surplus honey during the first season.

Answers to Extra Credit Questions

16. **False.** Starline honey bees are based on a four-way cross of inbred lines derived from the Italian race.
17. C) Carniolan
18. A) Italian
19. B) Caucasian

There were a possible 24 points in the test this month. Check the table below to determine how well you did. If you scored less than 12 points, do not be discouraged. Keep reading and studying — you will do better in the future.

Number of Points Correct
24 - 18 Excellent
17 - 15 Good
14 - 12 Fair

everything works. What he lacks in detail, he more than makes up for in enthusiasm — which is why he's starting with bees. He really wants to learn. I don't think honey is his main goal, but rather the challenge, and serenity that this past-time brings to each of us.

But if he does make honey, his training in marketing should hold him in good stead.

This should be fun to watch. I'll keep you posted.

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If you haven't noticed by now, there are several articles relating to pollination in this month's issue. This is not a coincidence. There are four things I have always felt pretty strongly about; using queen excluders, pollination, honey quality and record keeping.

You may have noticed this already, and that's good. If not, notice it now.

I'm only going to address pollination this month, but the others will come up eventually.

Much has been written, here and elsewhere, about the value of pollination honey bees do in this country. Millions and millions of dollars. These figures come from somewhere I suppose, and there is a proposal in Washington to accurately access this value. But this isn't what is important, today, to you and I. What is important is the value to us of preparing a colony for moving, moving it, and then moving it again — either to another crop or back home.

This is work. Pure and simple. If you're like me, or Buzz Riopelle, or Buzz Phillips, it gets done by usually one person. Closing, banding or stapling, lifting on, lifting off, opening, reclosing, relifting on or relifting off again, opening and all the while hoping you don't lose the queen, drop a colony, get sprayed, it doesn't rain or snow, and that your truck doesn't quit in the middle of all this. With the stress this puts on a colony, EFB is a real possibility, along with other nasties that always show up in one or two colonies when it's all done.

And, what do you get for this? Besides old, fast? I figured it out. For the 10 colonies we use to pollinate it *costs* me $20/colony, not including my labor, to get them back home, after one crop. This includes an extra trip to the yard, banding material, screen closings, tape, gas, 1 hired helper, wear and tear on equipment and truck, medication for the colonies that need it and extra feed.

If I counted my time (which, I'm told, no self-respecting beekeeper would EVER do) the cost would be considerably higher.

Personally, I can't afford to do this, and I'm wondering why each spring I pursue this insanity.

Well, I'm told by those who know better, you have to. Those growers must have bees to get a crop. But if you charge them what it's worth, to you *or* to them, they'll find somebody who will do it cheaper.

It never fails, there is always somebody who will do it cheaper — no matter how cheap you go!

I think this year I'm going to change my strategy a bit. I'm going to charge what I'm worth, not what another beekeeper thinks he's worth. You get what you pay for is one way of looking at this.

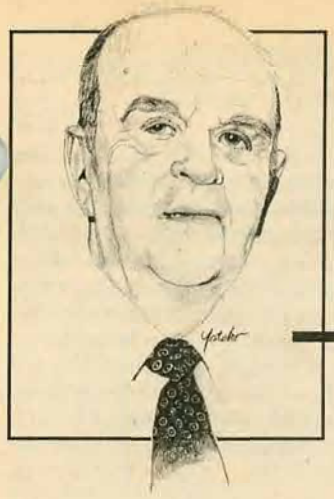
But another is that if this ever-present competitor can actually do the same job for less money, then he should have it — that's only good business, for both grower and beekeeper.

If I get priced out of business this spring I'm not going to worry much. Either my competitor will continue as before, as a good, smart businessman, and I won't get back in, or the economics of this job will catch up with him, and his price will rise to equal mine and we'll both be in business.

Which brings up good record keeping, previously mentioned. I know my costs. If my competitor does too, then either I'm not mechanized or efficient enough to compete with him.

But I'll bet he doesn't. Ignorance may be bliss, but it can be a costly state to be in, and I'm not about to lose my shirt because my competition likes to go bareback.

And neither should you.



KOOVER'S KORNER

CHARLES KOOVER • 1434 Punahou St. #709 • Honolulu, Hawaii 96822

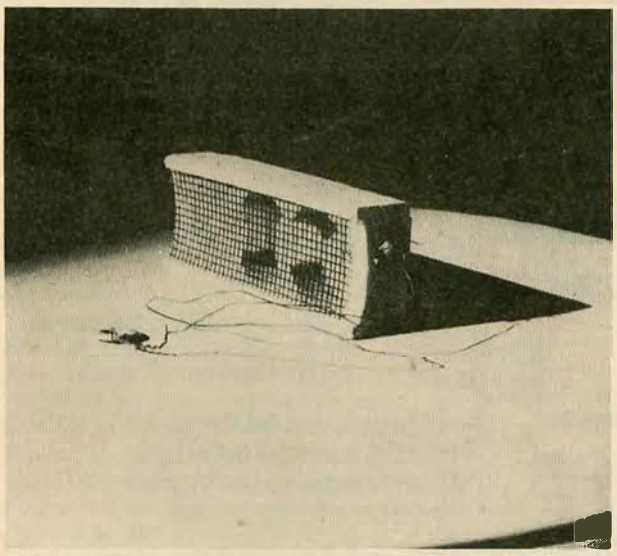
"Queen Introduction Simplified"

Spring is in the air and beekeepers are thinking of requeening their hives. For even yesterday I received 3 letters requesting information on how to make the Dr. Miller introducing cage.

Requeening is big business from the way letters have been coming in. It's also fraught with danger to the new queen, for many don't make it. One man wrote, "I ordered 5 queens and only one was accepted." That's a shameful waste of money and a simpler method is in order.

Most brood chambers consist of 10 combs. There is no room to clamp in the queen shipping cage as it comes through the mail. By that I mean spreading 2 combs and clamping in the shipping cage, wire face down, as it should be so the bees have access to the queen. You have to remove one end-comb and get it out of the hive. Before you do, number your hive with a pencil and number that comb. Grocery stores nowadays put your groceries in thin plastic bags. Save them as they come in handy — you may need two. Slip in your comb and the other one from the opposite end. Seal it with cellophane tape. So far, so good. Put that sealed-in comb in the house until you want to replace it in the hive. But don't forget about it. Check it for wax worms, as even the strongest hive has worms hatching all the time. If you forget to check these combs, you may find them riddled by wax worms.

What to do next? When your replacement queen arrives, force a thumb tack into the candy opening to prevent the hive bees from chewing out the candy and releasing the queen. Next, at the other end of the cage pull out the cork. Shove in a pencil so the bees can't come out. Slip a very thin wire around the cork and a washer at the other end of the wire to make pulling out the cork easy. So far, so good.



Push a thumb tack in candy opening so bees can't chew out candy. Twist a piece of thin wire around the cork and replace cork. Attach a washer to other end of wire for easy pulling. That's all.

Now go to your hive and find the queen you want to replace. Pinch her head off and throw her back in the hive. The bees find her and know they are queenless. Clamp your replacement queen and attendants in their shipping cage real tight between 2 combs. You may want to stick a thumb tack on the side-bar of one comb to prevent the cage from sliding between the top bars which happened to me once. I thought I had released the queen and found her still caged 5 days later. No great harm done. I released her right there and then and she slipped between the combs. I watched her. She went straight to a comb, examined it, turned around and laid an egg. No worry about her, she was accepted on the spot.

As I told you before, after 5 days pull out the shipping cage. You may have comb started on the wire of the shipping cage. Shows you have a strong colony. Save that wax. Shove the 2 combs back together and slip in the comb you took out. That's all there is to it.

And now comes the greatest tip of all. J. E. Hastings, the famous queen breeder of Birch Hills, Sask. Canada, once wrote in *Gleanings* "When I introduce a queen, I rub the old queen's body over the wire of the shipping cage and the new queen is accepted every time". He ought to know. And finally you may ask, "Why didn't you tell us all this before?" Nice talking to you. Have a good spring!Δ

NEWS...

Federal Quarantine Proposal Made by APHIS

APHIS officials in early March submitted a proposal to USDA officials to enact a Federal Quarantine regarding varroa mite.

Milt Holmes, APHIS Operations Officer reported that the quarantine proposal, if enacted and not modified before acceptance, would follow these general guidelines:

- The quarantine, administered by the PPQ arm of APHIS, would restrict movement of *colonies* from known infested states until certified apparently mite free.
- To earn certification, colonies from known infested states (see survey, below) must be treated for 21 days, according to the Section 18 label instructions on Apistan Strips.
  -Label instructions state PPQ must administer Apistan if possible. In not, state regulatory agents, after training can; if not, individual beekeepers, after instruction and signing a compliance form can treat their own colonies.
- After 21 day treatment, colonies will be certified for movement.
- Package and queen producers will be working under a somewhat different set of rules.
  -Packages, to be certified (remember, certification is only required if packages originate from a known infested state) must be shaken into shipping containers, supplied with one or more package size Apistan strips, and left for *several days*. Packages ***cannot*** be shipped with the treatment strip(s) still in the package.
  -Queen producers are under essentially the same guidelines as package producers.

APHIS will institute a national survey this spring (probably already underway as of April 1) which will test 5% of all known apiaries in all states using the DeWill detector board and Apistan Strips. This definitive survey will determine which states are infested and to what, if any, degree.

Obviously, queen and package dealers are concerned about the treatment period involved. The additional stress on bees will be significant, and, without perfect storage conditions, it is feared many bees will be lost.

Mr. Holmes also stated that once the official survey is complete, the director may declare an area within a state infested, establish a 100 square mile quarantine area around that site, and declare the rest of the state mite-free.

We stress that the parameters of this quarantine may change at any time, and in fact, may have changed already, since there is a 2-3 week delay between writing and printing.

To keep current with this quarantee, contact your state inspection officer. We cannot over-emphasize the need to keep abreast of this situation as pollination, package and queen seasons are here, now!

Bee Culture will update any changes or additions in next month's issue.

New American Beekeepers Federation Officers Elected

At their recent convention in Houston, TX, the members elected Reg Wilbanks, of Claxton, GA to succeed Randy Johnson as President. Mr. Bob Brandi of Los Banos, CA, was elected Vice President. Re-elected to serve a second term on the Executive Committee were John Haefeli, Monte Vista, CO and Alan King, Indianapolis, IN. Bill Shearman from Wimauma, FL, was also elected to the Executive Committee to fill the unexpired term of Dr. Jim Tew who resigned to avoid any conflict of interest since he had recently been selected as the Federal Extension Coordinator. Agreeing to "stay on" until September 1, 1988, Frank Robinson will continue to serve as Secretary-Treasurer until his replacement has been selected.

1988 Officers of AHPA elected at Albuquerque, New Mexico

•President
Richard L. Adee, Box 368, Bruce, SD 57220
•Vice-President
Jerry Cole, 600 North Bosque Loop, Bosque Farms, NM 87068
•Executive Committee
Horace Bell, 1058 S. Ridgewood Ave., Deland, FL 32720
•Executive Committee
Ray Chancey, 401 Cherry Creek, Dayton, TX 77535
•Past-President
Glenn Gibson, P. O. Box 368, Minco, OK 73059

Canada Ban Appears Firm

Reprinted by Alan Harman

Canadian honey producers fear a shortage of bees this spring because of the federal government decision to extend for two years a ban on the importation of honey bees from the United States.

The ban is an attempt to hinder the spread to Canada of *Varroa jacobsoni*, the Asian mite.

The closure was extended to the end of 1989 after the mite was found in several U.S. states, including California and New York.

"Most of the guys will be going out of business and Canada as a whole will suffer," said John Paradis, president of the Peace River Beekeepers Association in northern Alberta. "The price we get for honey is so low now, any increased cost to us would be crippling."

Producers pay C$25 a unit for bees imported from California. British Columbia breeders charge up to C$30 a unit. A unit of imported New Zealand bees costs about C$45.

An Agriculture Canada spokesman said the government in unlikely to change its policy. "The closure was decided on after consultation with the industry," the spokesman said, "although I understand there is conflict between what different provinces want."

And government Member of Parliament Stan Schellenberger, speaking to the annual meeting of the Canadian Honey Council on behalf of federal Agriculture Minister John Wise said: "I know this ban is a blow to many Canadian honey producers who rely on the U.S. for their bees. However, I am sure you appreciate the need for this precautionary measure in order to safeguard our industry."

British Columbia's supervisor of apiculture, Douglas McCutcheon, said while it has been easier until now for northern producers to kill off their stock and buy replacements each spring, that has to change. "We have to see more co-operation between different regions, with supplies coming from the southern reaches of the provinces."

McCutcheon concedes it is possible some northern producers will go out of business, but "if you allow bees from the U.S. and risk getting the mite then a lot of people would be out of business."

McCutcheon, noting predictions the mite could wipe out one million hives in the U.S. in the next five years, added: "From an overview the closure is the best solution, but from an individual producer's view, it's seen as a real mess."

There's one faint glimmer of hope. Bill McElheran, chief of animal imports for Agriculture Canada's food production and inspection branch, says the U.S. ban may be lifted if new developments suggest bees can safely be imported.

Agriculture Canada is prepared to reconsider the ban as new information comes to light. It gave as an example U.S. research into ways to kill any mites which may be in packages of bees being shipped.

But Graham Roberts, of Clarksburg, Ontario, is among a number of people who are not sure closing the border will keep infected bees out. "My personal opinion is that we're just buying time. Bees are sort of free spirits — they don't know borders. They can fly anywhere they want."

UC Offers New Publication on Beekeeping in California

Whether you have two bee colonies in the backyard or a commercial operation of 15,000 of them, each one has the same basic needs.

The University of California Division of Agriculture and Natural Resources can help you meet those needs in its new color-illustrated 70-page publication, "Beekeeping in California".

It offers an overview of the beekeeping industry in the state and gives information unique to western migratory beekeeping. Not an elementary introduction, the publication advises beginners to also read other references for details.

Along with describing the fundamentals of keeping bees, the publication discusses the differences between commercial and non-commercial approaches.

It includes in-depth information on becoming a beekeeper, the colony, choosing bees and equipment, managing and feeding bees, maintaining genetic stock, pollinating crops with honey bees, producing and marketing honey, commercial queen rearing, and sources of nectar. It also covers bee diseases and other disorders, pests of bees, and an observation beehive.

For success with bees, get your publication now. Order by title and number 21422. Write ANR Publications, Dept. NR, 6701 San Pablo Ave., Oakland, CA 94608-1239. Enclose a check for $3.50, covering tax and handling, payable to UC Regents.

Industry Summit Called For

During his keynote address at the recent American Beekeeping Federation Convention, Chairman of the House of Representatives Committee for Agriculture, "Kika" de la Garza, stressed several times the need for our industry to agree on a common position and present a united front in Washington if we really want to see the honey loan program salvaged. To work toward this goal, one of the Resolutions adopted by the ABF directed the officers to try to arrange a Summit Meeting with representatives of Sioux Honey Association and the American Honey Producers Association.

Following this directive we have contacted both Sioux Honey and the A.H.P. and asked that they join us in Fargo, ND, July, 1988 for such a meeting. Relying on a Moderator not connected with any beekeeping association we hope that we can all agree on what needs to be done in Washington and how we should go about getting it done, so that we will all be working for the same goals. The controversy about the Honey Loan Program in the closing days of the 1st session of the 100th Congress and the threat to the entire program as a result, makes it clear that we must have unity in our ranks!

... & Events

☆ INTERNATIONAL ☆

Beekeepers course is to be taught at **Fanshawe College**. Subjects include wintering, spring management, swarm prevention, nectar and pollen plants, pollination and honey harvesting and packaging.

The course will consist of four evening sessions at weekly intervals, plus six sessions at monthly intervals to be held outside. Course dates are: classroom - April 11, 18, 25 and May 2. Outside - May 7, June 4, August 6, September 10, October 1 and November 5.

For more information contact: Mr. Joe Dunn, P. O. Box 4005, 520 - 1st St., London, Ontario N5W-5H1. Phone 452-4441.

Your Next Meeting Notice should be here. Why isn't it? Send in your information now, while you're thinking about it. Allow a 2 month lead time — 3 is even better.

☆ ARIZONA ☆

18 year old **KRISTA MALIK**, daughter of Claudia and Allen Malik of Scottsdale, Arizona, was crowned the 1988 Beekeepers of Central Arizona (B.A.C.A.) Honey Queen at the annual Arizona Beekeepers Association (A.B.A.) meeting. The meeting was held on December 12, 1987, in Phoenix, Arizona.

Krista is a 1987 graduate of both Coronado High School and the LaVonnes Classic Beauty College. She is

currently a hair designer at Hannibal's Hair Emporium in Tempe, Arizona.

Throughout 1988, Krista will be promoting the beekeeping industry and the consumption of honey as she travels around the state.

After her reign as Local Honey Queen, Krista will compete for the title of Arizona State Honey Queen scheduled to be held in Tucson, Arizona in December, 1988.

☆ CALIFORNIA ☆

INSTRUMENTAL INSEMINATION TRAINING and Practical Bee Breeding Course. Designed for the serious beekeeper who wants to become familiar with the technique of instrumental insemination and plans to establish, or is operating a breeding program. The class is divided into two sections to provide the information necessary to develop and maintain a breeding program, and also to provide individual instruction in the technique of instrumental insemination.

SECTION 1. An intense one day seminar includes: basic bee genetics, various breeding systems with emphasis on the Page-Laidlaw Closed Population Breeding Program, colony selection methods and evaluation procedures, how to establish a selection index, pre- and post-insemination of queens, equipment set-up and adjustment, and a detailed, step-by-step slide show of instrumental insemination.

SECTION 2. The technique of instrumental insemination is precise. Consequently, individual class time will be arranged with each student at their convenience. This allows us to provide the detailed, individual, hands-on instruction necessary for you to become comfortable with the technique. Use of standard and large capacity syringes, glass tips, plastic tips, and the short term storage of semen will be covered.

Seminar class dates are June 18 and July 16, 1988. Fees for complete class including seminar and laboratory training is $200.00. Seminar only is $75.00. For more information, contact the instructors; Susan Cobey and Timothy Lawrence, at Vaca Valley Apiaries, 6745 Bucktown Lane, Vacaville, CA 95688. (707) 447-6723.

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A beekeeping Workshop sponsored by **THE SACRAMENTO AREA BEEKEEPERS ASSOCIATION** will be held on Saturday, April 23 and Sunday, April 24, 1988, from 9 a.m. to 4:30 p.m. at the Sacramento County Agriculture Extension Office,, Building Q, 4145 Branch Center Road, Sacramento, CA.

This workshop will be taught by Dr. Norman Gary, Professor, University of CA, Davis. Dr. Gary is an excellent teacher, noted author and researcher in the field of beekeeping and bee biology. He will present information relevant to present and potential beekeepers with all levels of skill and interest in beekeeping. There will be movies on bees, hands-on demonstrations, and ample time for questions and answers. Probable topics to be covered include seasonal management, swarms, bee behavior, diseases and prevention, harvesting honey, and dividing colonies.

Fee before April 10 will be $50.00, spouse/child $25.00. After the 10th, the fee will be $60.00. For more information contact Nancy Stewart, 2400 21st Street, Sacramento, CA 95818. (916) 451-2337 (Days).

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STEVE TABER is again offering 2 classes this summer.

•July 16, 17 and 18 will be on Intermediate Beekeeping, including location and ID of parasitic mites, bee diseases, queen manipulation and basic bee genetics. Included are field trips and guest lectures. Cost is $200.00 with a limit of 35 participants.

•July 21, 22, 23 and 24, a course on Artificial Insemination will be offered. This will include semen collection and injection, and care of virgins and drones. Evening lectures will cover bee genetics and various breeding programs. Cost of this course is $300.00 with a limit of 16 participants.

Noon meals and a banquet are included in both classes. Speakers include Steve Taber, Tom Parisian and other experts in the field of Beekeeping and AI. For more information contact Honey Bee Genetics, P. O. Box 1672, Vacaville, CA 95696. (701) 449-0440.

Participants from developing countries will be charged $150.00 and $250.00 respectively for these classes. Cost for meals for an accompanying person who is not a participant is $35.00.

☆ CONNECTICUT ☆

THE CONNECTICUT STATE BEEKEEPERS ASSOCIATION will hold their spring meeting on Saturday, April 23 at 10 a.m., at the Waterbury Campus, Waterbury Ct. The meeting will be in the Cafeteria.

Speakers include Kim Flottum, Editor of Gleanings in Bee Culture, who will speak in the a.m. on "A National Perspective of Varroa Mite", and in the p.m. on Beekeepers and Public Relations.

Also in the p.m., Diana Sammataro will give a demonstration on various pieces of beekeeping equipment, used and not used.

For more information contact Mr. Chuck Howe, (203) 491-2338. Pot luck lunch will be served at noon, and an auction and raffle will be later.

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THE WESTERN CONNECTICUT BEEKEEPERS ASSOCIATION will hold their monthly meeting on Thursday, April 21, at 8:00 p.m. at the Fairfield Co Extension office in Bethel on Rt. 6. The evenings' speaker will be Kim Flottum, Editor of *Bee Culture,* speaking on "Letters to the Editor that couldn't be printed!. There will be an auction, raffle and refreshments will be available.

☆ INDIANA ☆

A BEEKEEPERS WORKSHOP will be held on April 9, 1988 at the New Indianapolis Zoo, 1200 W. Washington Street, Indianapolis, Indiana.

9:00	Registration $10.00, includes lunch
9:30	Greetings
9:45	Video tape — Africanized Honey Bee, Claude Wade
10:00	Video tape — Varroa Mite, Claude Wade
10:30	Honey tasting — Owen McCain and Charles DeMoss. Bring your samples for others to taste.
10:35	Break - More honey tasting.
11:00	New Equipment and how to assemble, demonstration
12:00	Lunch
1:15	"The Joys of Beekeeping" — Gene Killino, supervisor of Apiary Protection of Illinois
2:15	"How to Produce Comb Honey" — George Robb
3:30	Installing Package Bees, Nucs, and Queens by Don Shenefield, Commercial beekeeper.
4:00	Adjourn

For more information and reservations contact Steve Welch, R. R. #1, Box 190A, Decatur, IN 46733 by April 1, 1988.

☆ KANSAS ☆

The 1988 Spring Meeting of the **KANSAS HONEY PRODUCERS ASSOCIATION** will be held at the Best Western Holiday Manor Motel, at the Junction of I-135 and U. S. Highway 56, McPherson, KS 67460, (316-241-5343) on Friday, April 8th, with registration beginning at 9 a.m. and on Saturday, April 9th, with registration beginning at 8 a.m.

Featured at the meeting will be Dr. Joe Moffett, ARS, USDA, Weslaco, TX. Dan Hall, Manager of the National Honey Board will speak Friday afternoon. Don Gunness, Abercrombie, North Dakota, inventor and manufacturer of the revolutionary new uncapper will also speak and display his product. The banquet Friday evening will feature a video of Howard Weaver and Sons, Inc. and the Weaver Family Apiaries, Inc. operations in Navasota, TX which is celebrating one hundred years of beekeeping.

More information can be obtained from Robert I. Brown, FGD 1, Box 96, Haddam, KS 66944, (913) 778-2954.

☆ NEW YORK ☆

THE WILLIAM H. MINER AGRICULTURAL RESEARCH INSTITUTE will be holding it's annual Beekeeping Seminar on Saturday, April 30, 1988 from 9:00 a.m. until 3:00 p.m. at Miner Institute in Chazy, New York. Dr. Richard Fell from Virginia Polytechnic Institute, Blacksburg, VA will be the guest speaker.

You may register at the door, but pre-registration would be appreciated. Registration will begin at 8:30 a.m. with the program starting at 9:00 a.m. The cost will be $10.00 per person and this fee will cover coffee, donuts, lunch, handouts and membership into the Champlain Valley Beekeepers Association.

The meeting is sponsored by the William H. Miner Agricultural Research Institute, and the Champlain Valley Beekeepers Association. For further information, please contact Loretta Surprenant, Miner Institute, Chazy, NY 12921 (518) 846-8020.

☆ OHIO ☆

One of Ohio's **LARGEST BEEKEEPERS' SCHOOL** is set for Saturday, April 2, 1988 at Lakota High School, 5050 Tylersville Road. The program is designed for all beekeepers and those who would like to be. Beekeepers' Associations in Southwest Ohio and The Ohio Cooperative Extension Service offer this program to provide more understanding of the honey bee. The program begins with registration at 8:00 a.m. and adjourns at 4:30 p.m.

Cost for registration and lunch is $12.00 for adults and $8.00 for youth 18 years and under. Reservations are due March 25 to Don Cooke, 731 Miami Ave., Terrace Park, Ohio 45174.

Program topics include: Getting Started; Comb Honey; Cooking; Marketing; Queen Rearing; Management; Swarm Control; Extracting; Honey Plants; Diseases; Beekeeping Equipment; Observation Hives; and live bee demonstrations.

For more information contact The County Extension Service in Hamilton, Butler or Warren Counties. The Hamilton County Representative is Don Cooke, (513) 831-3692.

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ATI WORKSHOPS. For the past few years, the **Agricultural Technical Institute of the Ohio State University** has offered summer short courses. These courses are actually compacted

regular classes, they are intensive and comprehensive. We realize that many beekeepers have problems finding time to attend summer programs, therefore, we are always searching for the right "mix" of course content and dates. This summer, we are trying the long weekend approach.

- On May 13, 14 and 15, 1988, we will offer introductory beekeeping. We gave this course a break during the past few years and feel that it is time to offer it again.
- On June 10, 11 and 12, 1988, we are offering a new program — Contemporary Issues in Beekeeping. On June 10, a full day of Africanized Beekeeping — the latest information. On June 11, Varroa Mites — What They Are and How Can They Be Controlled. On June 12, a discussion of Tracheal Mites during morning hours and a short discussion of Honey Marketing during early afternoon hours.
- The VIII International Beekeeping Seminar will be presented July 18-29, 1988. As in past years, this is a symposium on the International Aspects of Beekeeping. During the past years, approximately 200 participants have participated from 30 countries. We anticipate another successful year.

Additional information on all courses are available from: The Office of Conferences, Ms. Gail Miller, The Agricultural Technical Institute, Wooster, OH 44691. (216) 345-8336.

If we can be of any assistance, feel free to contact us.

☆ PENNSYLVANIA ☆

DELAWARE VALLEY COLLEGE, Doylestown, PA will again be offering its Spring and Summer Beekeeping Short Courses. Spring - March 25, April 9 and 16, 1988 and Summer - June 24, 25, and 28, 1988. The courses are offered under the direction of Dr. Robert Berthold (Professor of Biology) in co-operation with Mr. Jack Matthenius, (New Jersey Supervisor of Bee Culture) and other skilled apiarists. The program will include a special talk by Mrs. Marnie Berthold on home uses of honey. Instruction will take place on the Delaware Valley Campus, with the College apiary and Honey House being utilized.

The total cost of the three days of instruction is $35; you are urged to register early so that we know how many to plan for. However, it is permissible to register on the first day of the course with no penalty. For further information contact Dr. Berthold, Delaware Valley College, Doylestown, PA 18901 or (215) 345-1500.

☆ TENNESSEE ☆

A new state-wide organization called **BEEKEEPERS OF TENNESSEE** was formed in December by a number of Tennessee beekeepers aware of the important role honey bees play in the overall economy of the state, and many eminent problems that face the industry nationwide as well as locally.

Most beekeepers are knowledgeable of the tremendous benefits of the honey bee in addition to the production of surplus honey. Unfortunately, the general public and public officials are not as aware of those benefits as beekeepers. The organizers of the new association felt that existing beekeeper organizations are focusing attention and resources more on the problems associated with the marketing of surplus honey through Honey Queen programs and completely ignoring some of the more important issues that can directly impact the total honey bee population. This attitude has left most government officials and the general public in a state of apathy towards beekeeping.

The organization has already held meetings with the Executive branch of the Tennessee State government, the University of Tennessee College of Agriculture, and leading farm organizations. The meetings have confirmed that much work needs to be done to communicate the problems to public officials, and assist them in developing policies to cope with the problems now at hand and those on the too near horizon.

The short term goals of the BEEKEEPERS OF TENNESSEE organization are:

1) Protect our bees from tracheal and varroa mites;

2) Substantially increase the public awareness of the importance of honey bees in Tennessee;

3) Improve the effectiveness of the Tennessee Department of Agriculture Apiary program; and

4) Provide needed training to beekeepers.

A bi-monthly newsletter *Tennessee Bee Line* will be published. Annual membership dues are presently established at $10.00 per year. Mr. Howard Kerr has been elected as interim president who will serve until the first annual meeting to be held in the spring. Further information can be obtained or membership subscriptions can be mailed to: Beekeepers of Tennessee, Rt. 11, Box 7, Maryville, TN 37801 or (615) 982-6750.

BEEKEEPERS OF TENNESSEE will hold a 2 day meeting on May 13 and 14 in the Knoxville area. An international slate of speakers is scheduled to present information on "A New Era of Beekeeping". See May *Bee Culture* for complete details.

☆ Classified Corner ☆

Classified rates: 55¢ per word, each insertion payable in cash in advance. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it) counts as one word. Copy or cancellation orders **MUST** be in by the 1st of the month preceding publication (Example: January 1 for February publication). If your order has missed the cut-off date, your ad will appear in the following issue. Proof sheets available on request for an additional 2-word charge. Send classified ads to: The A.I. Root Co., Attention: Cyndi Stephens, Class. Ad. Mgr., P. O. Box 706, Medina, Ohio 44258-0706. For more information call (216) 725-6677, ext. 213.

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ALMOND POLLINATION NEEDS YOUR BEES — If you can provide strong colonies, **Pollination Contracting** now arranging contracts. Offering reliable service in central CA for 1988 season. L. Hicken (209) 823-5141 or C. Carroll (209) 823-1386. (4/88)

PROPOLIS USA, Route 8, Hayward, WI 54843 is buying hive scrapings and propolis. New suppliers please send 5-10# sample. Paying $2.00 - $6.00 per pound plus freight. Call (715) 634-4274. (TF)

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10 HIVES, plus 40 deeps, 10 shallows, small extractor (in excellent condition). Miscellaneous equipment. Michigan thumb. Best offer. Don (313) 886-9557. (5/88)

30 COLONIES DOUBLE story hives, also honey supers. Cliff Miron, Ashland, WI 54806 (715) 682-4180. (4/88)

HOBBYIST HAS QUIT! For Sale: Root Cowan 2 frame reversible extractor, along with related extracting equipment (electric knife, strainers, etc.) $100.00 Cash. (419) 485-3131. (5/88)

SOLAR WAX MELTER - $39.00. Free Illustrated Folder. Ellison's, 106 Clinkscales St., Belton, SC 29627 (4/88)

400 2-STORY, WITH 2 small supers, $75.00 each. Take pick of 600 hives. Wanetta Dotson, R#6, Wapakoneta, Ohio 45895 Ph. 568-5902. (4/88)

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175 STANDS, WITH EXTRACTOR, lots extra equipment. Write for details and price. Stearns, 4605 Redstart, Houston, TX 77035. (4/88)

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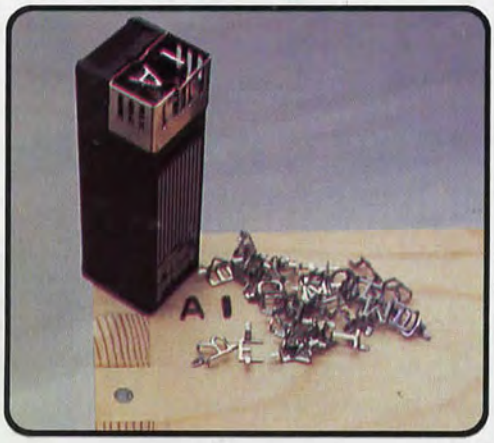

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