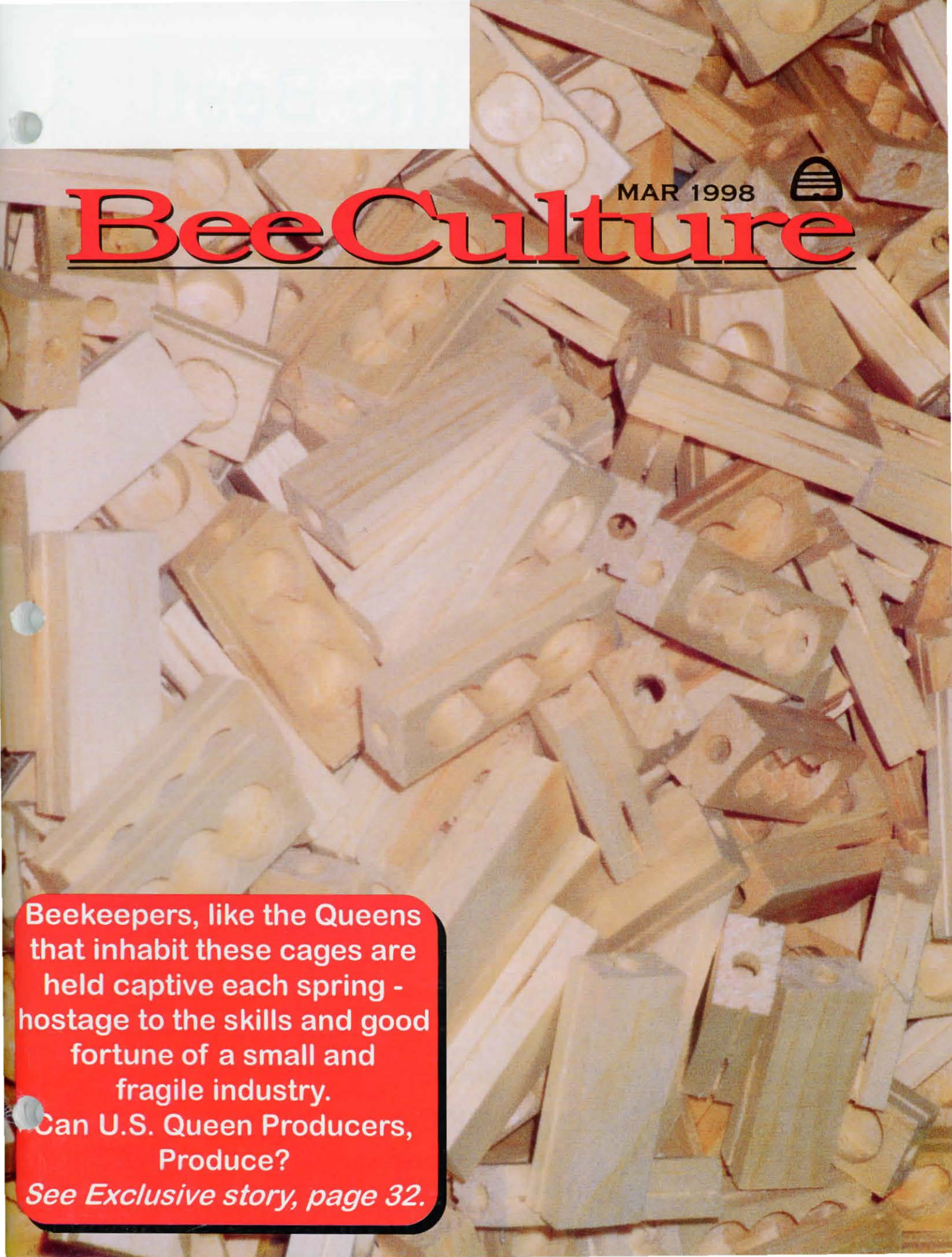
MAR 1998

Bee Culture



Beekeepers, like the Queens that inhabit these cages are held captive each spring - hostage to the skills and good fortune of a small and fragile industry.

Can U.S. Queen Producers, Produce?

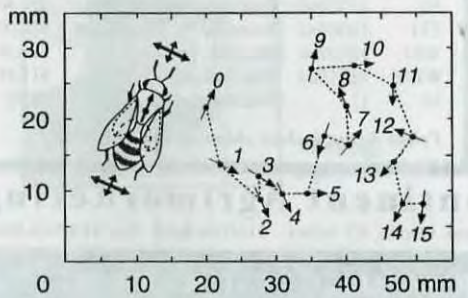
See Exclusive story, page 32.

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

MARCH 1998 VOLUME 126 NUMBER 3

FEATURES



A Tale Of Two Bee Dances, pg. 21

COVER

At the ABF meeting in January, scientists, producers and queen users gathered together to explore the recent charges and changes in queens produced in this, and, it turns out other countries.

Queen cage technology has changed over the years and the 3-hole is still the most often represented as 'the' cage. However, plastics and different candy formulas have changed what queens must face.

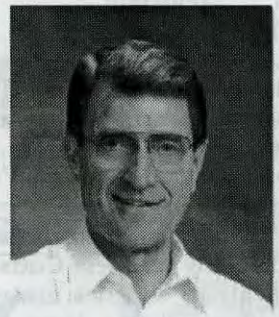
photo by Kim Flottum

Protection pg. 24

DEPARTMENTS

COLUMNS

Missing, Pg. 64



JOHN ROOT
Publisher

KIM FLOTTUM
Editor

Bee Culture is Printed on Recycled Paper

INNER COVER

Last Summer I attended the symposium in East Lansing on the retirement of Roger Hoopingarner. One of the speakers there, from Italy, outlined the development of *Varroa's* resistance to fluvalinate in his and several surrounding countries. He discussed situations of abuse, then pockets of resistance, then general resistance and finally massive resistance, in an entire region of Europe. He outlined the timetable that evolved in his area, and, essentially, warned the U.S. that we could, and should expect a similar pattern. Well, he was right.

There is, apparently, a significant population of *Varroa* mites in this country now resistant to fluvalinate. Apistan, of course is a form of fluvalinate, but unfortunately other forms have been used, and this has advanced, to some degree, this problem. It was the same in Europe.

Resistance development was a sure thing however, mites and pesticides being what they are. And 10 years or so seems to be the magic number. Expose *Varroa* to this chemical, in any form, for that period of time and they'll figure it out and get around the problem. And now it's here. Big time.

Some sources estimate resistant mites exist in at least 10 states. Florida leads the pack, but the main migratory states – Texas, South Dakota, California and North Dakota among others, have reported a similar situation.

There's a stop-gap measure plan being offered. At the Federation meeting in Colorado Springs, the people from Novartis (owners of Apistan), in an effort to preserve the use of Apistan, discussed with Federation officials the possibility of treating colonies with resistant mites with a different chemical – Amitraz – to eliminate those mites resistant to fluvalinate.

I talked to Lawrence Cutts, Apiary Inspector for Florida about the progress of this event after the Federation meeting. At the present time, and in the course of corporate events, the situation is this. When Novartis began purchasing companies, they had to give up some things so they didn't have a lock on certain chemicals. However, as they continued to grow, some things came again under their control – Amitraz being one, but, actually, not quite. The controlling agency of Amitraz is AgrEvo, who is under Wellmark, who is under Novartis. Confused yet?

Anyway, AgrEvo, upon reflecting on past experience with Amitraz and beekeeping, is (as of late January) reluctant to become involved. Understandably, I would think. They are sympathetic to the situation but . . . reluctant.

Meanwhile, back in Florida, Lawrence Cutts is worried. "This is worse than when *Varroa* first came here," he said in a phone interview. "it is, simply, disastrous," he added. Twice.

Effective treatments are as scarce as hensteeth at the moment. That means none, if Apistan doesn't work. Formic is close, but not yet in the game, so the fear is that all manner of other stuff may get used. Not good, by my guess.

There's more. The Florida people have made a pretty good case for the ether roll test and colony crashes. Cutts said that when testing colonies for certification, colonies are required to have two or fewer mites in an ether roll test. More, and treatment is required or the colony dies. Pure and simple. Moreover, a colony needs to be certified as 'treated' if it is to get back into Florida later in the season. There's not a quarantine as such, but treat, or don't get back in. And, your colonies die.

The question is, if you have mites resistant to Apistan, and you have more than two mites, and you need to treat, what do you treat with? The rules are, treat. But the rules only say treat with legal chemicals. Take this a step further. It doesn't matter whether you're in Florida, Texas or Ohio. If you have mites resistant to fluvalinate, what do you treat with – that's legal?

So, at the moment it's a problem that won't go away, and won't get better. Past experience says that resistance will spread. How rapidly depends, to some degree on how we deal with the problem now. Novartis has a long 'Say' elsewhere in this issue, and a strong new promotional message too.

By now, early March, some of those colonies from the 30 or so migratory outfits in Florida with resistant mites are moving out – north and west. Some have already moved as far as California.

AgrEvo may have the only chemical available, useful on a commercial scale, to keep colonies alive this season. Or, it may already be too late.

Test your colonies, be prepared.

•

A word to the wise, and anyone else who drives around in a truck, checking outyards. Do you have a first-aid kit in that truck? Things happen, out there alone. A first-aid kit not only *should*, but *must* be a regular piece of equipment in every truck, in your truck. My brother, a pro in the field of first-aid (he's a First Responder and emergency RN), and a host of other professionals in

Continued on Page 44

Resistance; Emergency Prep; Agreement Finally

Reader Assistance

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Bee Culture

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MAILBOX

Open Letter To Beekeepers From Zoëcon

Apistan® strips have been successfully used by beekeepers to control *Varroa* mites for the last nine years. Apistan is the only federally registered product for use in beehives for the control of *Varroa jacobsoni*. During the past six months, however, rumors have circulated throughout the industry concerning problems with the strips.

We would like to provide you with the most up-to-date information on this situation. The concern is a lack of efficacy associated with the strips in limited areas of Florida, South Dakota and Pennsylvania. In some cases, the strips failed to provide the control that beekeepers have been familiar with and come to expect from Apistan.

Zoëcon personnel began investigating following several reports of control failures. Once the lot numbers and strips were provided, a list was compiled to determine if a common lot number or batch was involved. Strips provided were chemically tested to determine levels of fluvalinate and inert ingredients. Batch records of each reported lot were reviewed for inconsistencies.

After reviewing all the lot numbers, batch records, release rates and chemical analysis, there were no production problems with any of the strips from the reported lot numbers. There was no correlation to lot number in any of the reported failures. Lot numbers reported came from production as far back as 1995 and as recently as March of 1997.

During the course of investigation, independent of Zoecon, the USDA (Weslaco, Texas) began investigations of reported failures in South Dakota. Apistan strips failed to provide satisfactory control in their studies. Further studies in certain areas of Florida had similar findings. In still other investigations, the USDA has taken strips that failed to work in Florida to parts of Texas, Mexico and Guatemala. In these studies, the exact same strips provided control of mite populations.

There does appear to be a common link between the failures in South Dakota and Pennsylvania. It appears these hives have spent some time in Florida either over-wintering or as pollinators shipped out of Florida. This commonality indicates the possibility that there is a low-level tolerance to fluvalinate associated with these limited areas of Florida. We do not know what the level of tolerance is at this time.

For the majority of beekeepers, Apistan is and will continue to be an effective product for the control of *Varroa* mites. Zoecon is working intensively in conjunction with the USDA to devise alternate strategies and alternate control measures to assure *Varroa*-free colonies and prevent the spread of tolerant mites. In an effort to reduce the incidence of fluvalinate-tolerant mites, we urge beekeepers to use only EPA-registered products and follow label directions.

The use of ***any unregistered*** product threatens a beekeeper's livelihood. For instance, a pattern of illegal use of Mavrik® in Italy caused a resistance problem and resulted in the ceasing of Apistan sales in that country which deprived them of an important tool. The use of ***any unregistered*** product also exposes the beekeeper to unnecessary liability.

Until we know more about this situation, we urge beekeepers to monitor their hives closely for the presence of *Varroa*. Again, we are working to find alternatives to Apistan that can be used in rotational practices. Rotational practices will not only prolong the life of Apistan, but provide beekeepers the confidence and control they have grown to expect from Zoecon Apiary products.

Greg Braithwaite
National Sales Manager
Oscar Coindreau
National Sales Representative
Doug VanGundy
Specialty Product Support Manager

Stock Improvement

It is no secret that beekeeping in the United States has become exceptionally challenging and unpredictable during the past decade. Dyce Laboratory for Honey Bee Studies at Cornell University is dedicated to helping solve the many problems facing the bee industry. One project is a stock improvement program. I will be evaluating bees in the U.S. for beneficial traits, including resistance to parasites and pathogens. There are lots of 'good' genes out there, but they are not always easy to find. The best way to identify them is to screen large numbers of naturally-mated queens from all around the country for a number of desirable traits. That is where you come in. This Spring, I want to screen about 250 colonies for a number of beneficial traits. The better stocks will be incorporated into the stock improvement program. I am asking that beekeepers from around the country assist in this effort. You can do this by donating one or two, high quality supercedure queens, or one or two, high quality, locally-reared and naturally-mated queens from last year. These queens should be 1997 or 1998 queens. A population consisting of queens that have been naturally mated in as many different locations as possible will ensure a broad genetic base for evaluation. Every beekeeper who contributes will receive a report on the initial stock evaluation and will have the satisfaction of knowing that he or she contributed to solving he serious problems facing beekeep-

Continued on Next Page

MAILBOX

ers. Target shipping dates are April 15 through May 15, 1998. If you would like to support honey bee research that focuses on solving real problems faced by real beekeepers please call (607) 255-5443 and leave your name, address, phone number and number of queens you are able to ship. Thanks for your help.

Prof. Nick Calderone
Department of Entomology
Comstock Hall, Cornell University
Ithaca, NY 14853

BC on CD

When will *Bee Culture* become available on CD-ROM? I read that past texts of publication can be accessed on microfilm, but very few of us have microfilm machines in our reading dens. Having acquired a notable collection of past *Gleanings* and *ABJ* has fueled my interest. Cross-references to previous articles and missing issues leaves me in limbo. I believe others would have an interest in purchasing such a CD-ROM library.

Being an organic farmer as well as being a beekeeper, I have relished the Penncap-M references. I wish the EPA and the State regulatory division would enforce the regulations, instead of ducking the issue of which should fund the regulation enforcements. My bees continue to show the Penncap-M symptoms well into this Winter from applications made in May, three miles away from here.

Kim Naasz
Yakima, WA

Editor's Note: Bee Culture *is even now in the process of having past issues placed on CD. Entire issues – covers, every page including advertisements and all – are included. They will be available in either five year, or 10-year segments. Watch these pages for information this Summer or Fall.*

C.O.M.B.

A number of U.S. honey producers are deeply concerned that the recently approved policies of the American Honey Producers Association (AHPA) and the American Beekeeping Federation (ABF) that may, if finally adopted into law, will actually rob the U.S. producer of any opportunity to sell his product for a decent price.

Anticipating this eventually, a group of honey industry leaders have banded together for the express purpose of championing the U.S. producers' cause. This new group will be called "Coalition of Maverick Beekeepers" (COMB).

COMB, its members say, will mainly devote attention to educating the U.S. honey producers about the nuts and bolts of a smooth-running check-off program and how best to protect their rights when dealing with non-producer groups such as the honey packers and dealers.

Glenn Gibson, Oklahoma and Jerry Stroope, Texas will co-chair the coalition. Both men are past presidents of the American Honey Producers Association. "A five man Executive Board of Directors has been set up, but appointments have not been confirmed," Chairman Stroope said.

Glenn Gibson
(405) 352-4944
Jerry Stroope
(281) 996-1523

Ask The Honey Bee

A few comments are in order in reference to Wayne A. Moyer's Mailbox letter, "Evolution Not Excluded," *Bee Culture*, January 1998.

Bees as we know them today never came from another insect. A honey bee is different from any other insect. It is a queen bee, a worker, and a drone. It has three component parts that make up one.

Instead of taking pick and shovel and digging among the fossils and rocks, I went out to have a talk with my honey bees. They were busy buzzing in and out of their hives, gathering nectar and the various other things they need to do to keep their hive going. My bees know me quite well and they fly around me and I hardly ever get stung. I said to one of them, "I would like to talk with you."

The bee said, "buzz, buzz. What do you want to talk about?"

I asked the bee if Wayne Moyer is telling the truth, that you descended or evolved from another species. The bee answered, "I do not wish to get too involved in a discussion on religion and evolution, but what I tell you will be the truth, and that is what really matters."

"When looking at what I am and what I do, there is no other species anywhere like me. So I would have to say that I am what I am, because I was made this way. Let me tell you some of the things that I can do which are unique to me. My home (the beehive) is made up of one queen, a few drone bees, and thousands of worker bees. The queen has two egg compartments – one that holds fertile eggs and the other holds non-fertile eggs. The fertile eggs are fertilized when the drone mates with her. The worker bee and the queen bee are produced from the fertilized egg. The drone bee is produced from the non-fertile egg. So the drone does not have a father, only a grandfather.

I, the worker bee, gather the nectar, pollen, water, and propolis that are used in maintaining the hive. I did not learn to do any of these things from my mother (queen bee) or father (drone bee) because neither of them do any of these things. I do them because I was made that way. A billion years of evolution could in no way bring about these great and wonderful things that I can do. On top of all that, I work in the dark and when it is cold outside, I can produce heat and warm the inside of my home."

The bee concluded in saying, "buzz, buzz, Well, I am heading for Mr. Christian's orchard which is one mile away to get some nectar for my home. As I am getting nectar, I am also helping pollinate the apple blossoms so the tree will produce apples this year. By the way, the things I get nectar from were made the same time that I was made, or else neither of us would be here today. Buzz, buzz."

Theodore F. Helzerman
Fowlerville, MI

MAILBOX

Editor's Note: *Although the writer takes a few liberties with this topic, the distinction between the theories of evolution and creation as outlined in this and a couple of previous letters is clear.*

And, though we have aired some of the opinions regarding this subject for mostly educational and enlightening background, we now feel the topic has been discussed enough. This magazine is not the best platform for this debate, nor, even if we were to explore it further would we settle the question.

Research Funds Available

Last year at the American Beekeeping Federation meeting in Norfolk, Virginia, some members of the Queen, Package and Nuc producers agreed to establish a voluntary research program that would be funded by donations from participating queen, package and nuc producers and awarded to successful competitors in response to a request for research proposals. The Queen, Package and Nuc producers wanted to contribute to research to help solve problems that are of immediate concern to the beekeeping industry.

At the American Beekeeping Federation meeting in Colorado Springs, Colorado in January 1998, the queen, package and nuc producers special interest group collected a substantial amount from a few generous firms and individuals. The contributors developed a list of research priorities and with the help of some of the bee scientists present at the meeting formulated the following Request for Research Proposals. We are contacting you to publicize our solicitation of grant proposals in order to disseminate this information to the widest possible audience.

Participating members of the American Beekeeping Federation Queen, Package and Nuc Producers have accumulated funding for research projects in apiculture. The contributors wish to support projects directed toward solving, or helping with today's major beekeeping problems. Current contributors include Kona Queen Company, Glenn Apiaries, Heitkam's Honey Bees, Strachan Apiaries, Presley Apiaries and B. Weaver Apiaries. Other members of the Queen, package and Nuc Producers have pledged their financial support, including Walker Apiaries, R. Weaver Apiaries and Wooten's Golden Queens. Please support those Breeders who are putting a portion of their money to work for you, or alternatively, encourage your breeder to contribute to the research fund. The committee of contributors solicits research grant proposals on the following topics pursuant to the guidelines listed below.

1. Development of honey bee stocks resistant to *Varroa*.
2. Causes of early queen failure and supersedure (or lack of supersedure) in queens sold individually, or in packages and nucs.
3. Test/monitor commercial queen stocks for diseases and mites, and the effect of diseases and mite infestations on queen longevity and fecundity.
4. Effects of acaracides during treatment, or through residue accumulation in wax on:
   a. Behavior of drones
   b. Production of semen
   c. Viability of semen
   d. Behavior of queens
   e. Fecundity of queens
   f. Viability of embryos and/or brood
5. Effect of queen cell contamination, chemical composition, or residue accumulation in wax on queen health and performance.

All research proposals should be limited to 10 pages, including:

1. Objective of the research.
2. Enough protocol for the reviewer to determine the feasibility of the approach.
3. An itemized list of the costs of the research.
4. The anticipated benefit to the industry at the completion of the study.
5. Each proposal should be limited to $10,000 or less.
6. No indirect or overhead costs may be included in the budget or deducted from the amount awarded.

Please send proposals to: Daniel Weaver, c/o B. Weaver Apiaries, Inc., RR 1, Box 256, Navasota, TX 77868, FAX 409-825-7351.

Proposals must be received by April 1, 1998 for duplicating and dissemination to the Research Committee members. The committee will review the proposals in consultation with a panel of objective research scientists and make funding decisions by July 1, 1998.

If you have any questions regarding these issues please contact me at the number listed above.

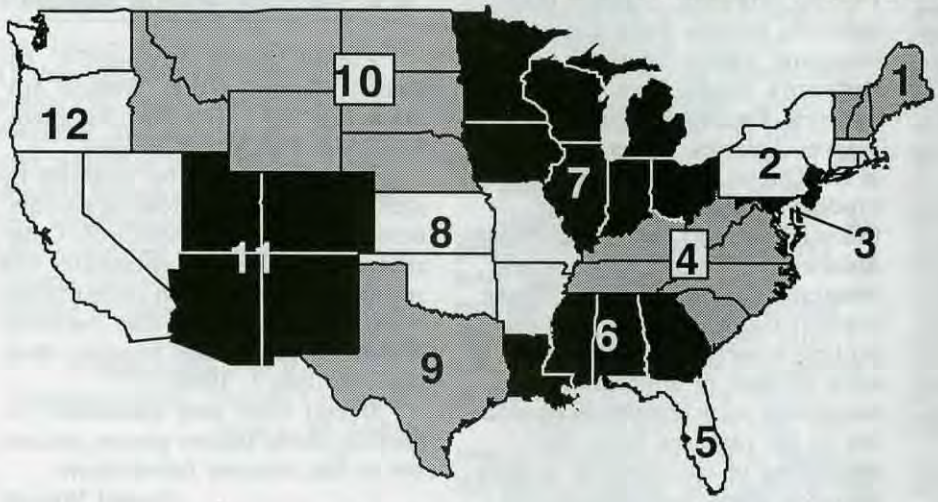
Daniel Weaver
Navasota, TX

Need Artists!

Fellow beekeepers, now is your chance to be famous! Erik Johansen and Gail Amos of Washington State's Pesticide Management Division have challenged beekeepers to create an ideal pesticide/bee hazard Icon, (cartoon type drawing) that can be likened to the skull and crossbones, (poison/death) icon. The Icon should be developed and put on pesticide labels to alert applicators as to pesticide hazards to our bees. Instead of waiting for the government to do this and coming up with a bogus idea, I'm calling on my fellow beekeepers to come up with some great ideas. Sorry, no monetary rewards, just the pleasure of seeing your idea applied in this state, if not the entire nation. What do you think? As a picture can be worth a thousand words, a hazard character could save bees from being devastated by pesticide applications. If this Icon becomes a reality, it could be printed in strategic locations in applicator reference handbooks, pesticide product labels, pesticide flyers, etc. Caution this could cause Icon clustering on pesticide labels! Send your drawings to Jim Downing, EPA 7506C, 401 M St. SW, Wash. DC 20460 or Erik Johansen, PMD – Dept of Agr., P.O. Box 42589, Olympia, WA 98504-2589.

Kim Naasz
Yakima, WA

MARCH – REGIONAL HONEY PRICE REPORT



Region 1

Prices down at bulk and wholesale, but steady at retail since last month. Demand at bulk and wholesale increasing however. Retail demand showing local product does better.

Region 2

Prices at bulk and wholesale mixed but generally steady to down just a bit from last month. Retail prices up pretty much, but demand steady to declining.

Region 3

Bulk, wholesale and retail prices down, but retail the least. Demand at bulk high, wholesale mild, retail steady. Local product consistently outsells others, but not enough local.

Region 4

Bulk prices down since last month, but wholesale and retail strongly steady. Demand declining, however, across the board.

Region 5

Bulk prices down, wholesale and retail prices steady since last month. Demand reported only steady to dropping, especially at retail.

Region 6

Bulk prices steady to declining a bit, but wholesale and retail steady to increasing a bit. Demand only steady overall, bulk the least demand (none in some cases).

Region 7

Bulk prices dropping, but only slowly. Wholesale steady to dropping but retail steady to increasing a bit. However, some declines in retail prices showing up. Demand for bulk surprisingly strong, but for local products. Retail demand slowing.

Region 8

Bulk and wholesale prices steady to down a bit. Retail prices increasing. Demand steady for bulk and wholesale, but price is the factor. Retail demand declining.

Region 9

Prices steady, demand steady, market stagnant. However, demand appears to be declining, especially in bulk, with lots of foreign in warehouses.

Region 10

Bulk prices steady to declining but wholesale case prices increasing a bit. Retail prices, and demand steady. Local seems stronger, but barely.

Region 11

Bulk prices steady to declining a bit, but wholesale and retail down. Demand, for the most part is steady to good, but weak spots are evident.

Region 12

Pollination more important than honey at the moment (or maybe, how well dohives float and how deep will trucks sink), but prices, and demand steady – if slow. Imports strong, but local products do well.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													Range	Avg.	Month	Yr.
Wholesale Bulk																
60# Light	60.29	70.25	58.00	68.33	64.50	67.90	61.20	74.39	54.00	63.00	70.00	59.67	45.00-85.00	63.18	69.45	68.87
60# Amber	59.74	64.75	50.40	64.36	62.40	63.00	58.68	69.70	52.00	63.00	66.50	62.00	10.80-89.40	62.07	66.21	63.88
55 gal. Light	0.75	0.74	0.72	0.73	0.79	0.77	0.82	0.81	0.88	0.71	0.82	0.82	0.63-1.25	0.78	0.89	0.97
55 gal. Amber	0.72	0.71	0.87	0.73	0.74	0.70	0.79	0.75	0.85	0.70	0.78	0.78	0.58-1.25	0.74	0.84	0.91
Wholesale - Case Lots																
1/2# 24's	28.92	28.38	30.39	32.80	30.39	29.67	28.04	30.39	30.00	30.39	28.57	30.39	24.00-37.20	29.98	29.62	30.66
1# 24's	43.91	39.04	43.20	43.65	40.80	40.33	47.82	41.26	48.00	42.00	42.78	47.20	32.40-88.00	44.18	43.45	42.86
2# 12's	41.20	38.78	40.20	42.81	36.10	38.30	45.21	41.90	42.33	39.33	42.70	39.18	29.40-62.00	41.61	38.48	39.41
12 oz. Plas. 24's	35.81	34.82	40.80	38.49	37.00	28.13	36.39	32.64	41.25	41.80	41.30	36.80	32.80-46.80	36.98	35.68	35.53
5# 6's	43.89	43.28	46.50	44.80	39.00	40.36	45.22	57.17	45.00	37.00	43.35	39.00	30.00-97.50	44.02	**40.98**	**39.37**
Retail Honey Prices																
1/2#	1.79	1.57	1.83	2.17	1.29	1.85	1.74	1.84	1.95	1.83	2.11	1.75	1.29-3.20	1.81	1.81	1.86
12 oz. Plastic	2.21	2.34	2.25	2.28	2.20	2.23	2.16	2.23	2.95	2.25	2.36	2.18	1.69-3.00	2.25	2.21	2.17
1 lb. Glass	2.60	2.64	2.50	2.62	2.00	2.71	2.52	2.73	3.50	2.44	2.86	2.83	1.99-3.50	2.65	2.69	2.66
2 lb. Glass	4.39	4.36	4.50	4.63	4.02	4.74	4.26	4.37	4.45	4.68	5.05	4.75	3.59-5.79	4.49	4.43	4.61
3 lb. Glass	6.20	6.87	6.50	6.27	5.15	6.28	6.97	5.78	6.25	5.49	6.40	5.70	4.50-11.00	6.30	6.21	5.92
4 lb. Glass	8.36	6.85	10.92	7.85	7.50	6.63	13.48	7.95	6.90	10.92	10.92	10.92	6.00-18.35	8.40	8.10	7.37
5 lb. Glass	8.78	10.04	9.75	9.26	8.50	8.17	7.87	9.28	9.95	7.90	9.21	9.25	4.50-14.00	9.00	9.14	9.32
1# Cream	3.22	3.34	3.76	3.45	3.76	3.51	2.97	2.99	3.75	2.52	3.41	3.03	2.25-5.75	3.27	3.22	3.27
1# Comb	3.95	3.85	4.02	3.50	4.02	4.00	4.25	3.48	6.00	4.02	4.92	4.73	1.95-6.00	4.10	4.08	3.93
Round Plastic	3.67	3.22	3.50	3.66	4.13	4.00	3.06	4.50	6.00	4.13	4.00	4.62	2.60-6.00	3.80	3.69	3.65
Wax (Light)	2.56	3.18	2.50	1.68	2.25	2.50	2.13	2.50	4.25	3.05	2.38	3.00	1.05-5.50	2.59	2.69	3.04
Wax (Dark)	2.66	2.70	2.25	1.48	2.00	2.26	3.27	2.00	3.50	2.59	2.22	2.75	0.95-4.25	2.56	2.37	2.64
Poll. Fee/Col.	35.85	38.50	31.00	41.00	25.35	38.00	35.71	38.50	15.00	38.00	50.00	32.67	15.00-60.00	36.80	35.93	36.99

Roger Morse

Research Review

"Kin recognition within a colony may favor queen production, but not, apparently, swarming behavior."

Middle-aged bees may specialize in several different areas including being undertakers, guards, food storers or wax workers, though they still do a broad range of other tasks. In the study reported below it is shown that undertaker bees "also were more likely to remove debris and to remain in the lower region of the hive or near the entrance." Debris removal includes the removal of diseased brood and introduced materials such as wood chips. Guards also remain in the lower portions of the hive and near the entrance. Guards and undertakers are less likely to do tasks normally done by younger bees than are other middle-aged bees.

It is especially interesting that guards and undertakers start to forage at a younger age than do most bees. The authors of this paper suggest that undertakers and guards may be slightly more advanced as regards their development.

It is not clear why these differences exist among bees. It has been shown that juvenile hormone, an internal glandular secretion, is present at higher levels in guards and undertakers than in other middle-aged bees. Differences in the rate at which adults develop and change tasks may vary because of genetic and/or environmental influences. At this stage in the research, the answer to the why question is vague, but showing that differences exist is the first important step.

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Trumbo, S.T., Z-Y. Huang & G.E. Robinson. *Division of labor between undertaker specialists & other middle-aged workers in honey bee colonies.* Behavioral Ecology & Sociobiology 41: 151-163. 1997.

Preferences in Pollen Feeding

Observations made in Ontario, Canada, showed that 82% of the pollen collected by honey bees in one study location was from plants introduced into North America. This caused the authors to write, "It is possible honey bees, a species introduced to North America in the 1600s, preferentially forage on introduced plant species, many of which evolved in Europe along with the honey bee." This is an interesting thought I have not seen expressed elsewhere that supports the idea that honey bees are the ideal pollinators for many introduced crops.

I was also interested in the fact that 40 of the nearly 14,000 pollen pellets examined were from ragweed, which is wind-pollinated and normally thought too dry for bees to collect. This is another example of the fact that when moisture conditions are right and dry pollens are somehow moistened, bees do not hesitate to collect them.

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Kinship Recognition

A queen bee mates with a large number of drones. The figure most frequently quoted is 17. However, the number of matings may be higher. These matings all take place within a few days, soon after the queen emerges from her cell and before she starts to lay eggs. The sperm is stored in a sack (spermatheca) in the queen's abdomen. Sperm are released as they are needed as the queen lays eggs during the rest of her life.

In the experiments reviewed below, two queens that mated 21 and 24 times each were observed. This means that a colony in which a queen mates 21 times is made up of 21 subfamilies while the second test colony has 24 subfamilies. The mother is the same in each colony but the fathers are all different.

The question posed in this research is whether or not this makes a difference when swarming occurs. In the primary swarm, all of the worker bees are daughters of the queen. However, if there is a secondary swarm, some of the bees are full sisters of the virgin queen that accompanies the swarm. Does this make a difference? Do members of the swarm divide according to their subfamilies? Do the full sisters of the new queen prefer to accompany, or not accompany, the secondary swarm? The answer, at least in this piece of research, is that it makes no difference. Either bees in a swarm do not recognize their kin, or if they do, this does not dictate which bees leave with the swarm and which ones stay behind in the parent colony.

This business of kinship recognition in honey bees deserves closer attention for several reasons. Chief among these is the fact that if it exists in honey bees, it could affect colony life and such practical matters as queen rearing. For example, do worker bees favor feeding and helping to rear their full sisters as queen or is there no such discrimination? The answer is that we do not have a clear picture.

The fact that humans recognize and favor their kin is clear and has been recognized for years. But what about other animals, especially social insects, where relatedness is a mixed affair? In the past 15-25 years this has been a favorite subject for experimentation. The chief argument in favor of kinship recognition on the part of other animals is that it is a way in which an animal such as a worker honey bee, which normally has no offspring, can pass her genetic background on to others by favoring one of her full sisters that happens to become a queen. BC

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?DO YOU KNOW?

Queens, and Queen Rearing

Clarence Collison
Mississippi State University

Young productive queens are essential to successful beekeeping. The queen has two primary functions in the life of the colony. She is responsible for reproduction and produces several chemicals (pheromones) that are important in maintaining the organization of the colony. Since success in beekeeping is so dependent upon the queen, beekeepers need to replace her at regular intervals in order to promote colony development and productivity. It is important for the beekeeper to understand the basic biology of the queen and the conditions required in order to produce a high quality queen, especially if they are going to raise their own queens.

Take a few minutes and answer the questions to find out how familiar you are with these topics.

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

1. ___ The preferred age of young larvae to be grafted and used in queen-rearing would be 24-36 hours old.
2. ___ Any fertilized honey bee egg has the potential of becoming a queen with proper care and conditions.
3. ___ Starter hives or swarm boxes that receive newly grafted queen cells may be either open or closed (allowing or not allowing flight).
4. ___ The number of queen cups found in a colony is an indication of colony condition, especially crowding in the colony.
5. ___ When the larvae have been grafted into queen cups or the combs to be grafted from are out of the hive, they should be wrapped in a damp towel.
6. ___ Most eggs and young larvae found in queen cups are there because they were moved from worker cells by workers.
7. ___ Queens are sexually mature when they emerge from the queen cell.
8. ___ Queen cells will inhibit the development of worker bee ovaries just as a live queen will.
9. ___ Capped queen cells should not be handled or moved until approximately 24 hours before the queen is to emerge.
10. In a queen breeder hive, explain why the breeder queen is confined to a single comb each day. (1 point).
11. Cell cups are often primed with slightly diluted _____ prior to grafting. (1 point).
12. Name two reasons for priming a cell cup prior to grafting into it. (2 points).
13. Describe the ideal conditions of a starter hive that receives newly grafted queen cells. (3 points).
14. Name two materials that queen cell cups are made from. (2 points).
15. How does the process of rearing emergency queen cells (accidentally lost) differ from queen cells produced from the swarming and supersedure impulse? (2 points).
16. Please explain why queens produced in supersedure or swarm cells are normally better than those produced in emergency queen cells. (2 points).
17. What is the procedure and advantage of producing double-grafted queens? (2 points).
18. Why would it be wise for you to plan to requeen a new colony just recently established from a swarm that you had captured? (1 point)

ANSWERS ON PAGE 52

Mark Winston

Extension and Regulation

"Why do I increasingly get asked questions about standard disease treatments, or simple life-cycle questions about honey bee pests, that should be common knowledge among all beekeepers?"

I continue to be amazed and delighted at the questions I get asked when I'm invited to speak at beekeeping meetings. Many of the questions are insightful, some have inspired me to conduct new research, and others are new and cover ground I've never considered, which is surprising and exciting considering how many thousands of questions I've been asked over the years. However, I've become more and more concerned about another type of question, which seems to be increasing in frequency: These questions where the asker really should have known the answer.

I don't believe that there is ever a dumb question, and I am patient when answering any query, no matter how simple it might appear. Yet, I've been asking myself "Why do I increasingly get asked questions about standard disease treatments, or simple life-cycle questions about honey bee pests, that should be common knowledge among all beekeepers?" The answer to this question is not too hard to figure out: There has been considerable erosion in our ability to develop and deliver extension information to beekeepers, and this important link between knowledge and application has become a seriously weak link in the information chain.

This may seem like a surprising comment, given the potential of today's electronic communication media to disseminate information. Yet, I find more and more misunderstanding among beekeepers about honey bee management and disease or pest control, in spite of the availability of home computers, Web sites and email that could be providing this information to our increasingly computer-literate industry. I attribute this diminished information transfer to the gradual demise of the once-proud and effective extension service in Canada and the United States, a service at the federal and state/provincial levels that used to be a shining jewel in agriculture but has become a tarnished shadow of its former glory.

You may be surprised to hear that both the United States and Canada used to have robust honey bee extension services in our respective departments of agriculture. This arm of the government was charged with the task of developing information about keeping bees and delivering it to beekeepers, and they performed this service magnificently. Further, most states used to have a similar, more locally focused service, and the two working in tandem provided a wonderful cascade of useful information to our beekeeping community. Today, the federal extension service is no more, and there is not a single individual in either of our federal governments performing this important job. A few states and provinces have retained their extension services in beekeeping, generally through an agreement with a local university, but most governments have cut back severely in this area, leaving beekeepers to fend for themselves in finding information. Thus, it's not surprising that so many beekeepers are hungry for good knowledge about basic management issues; the information they seek is no longer readily available.

This point was brought home to me in late October last year, when I was invited to the Oregon State Beekeepers' Association meeting in Hood River, Oregon, at a beautiful facility adjacent to the scenic Columbia River. One of the other speakers, Keith Delaplane, gave a fascinating talk about *Varroa* and economic thresholds. His research was designed to provide information to beekeepers concerning how to monitor *Varroa* levels and make treatment decisions based on the numbers of mites found in samples. This is the most simple, basic and critical information needed by beekeepers to make pest management decisions: How often should I treat, and when should I do it? Yet, Keith's work stood out to me because there is so little of that type of work being conducted today. There was a stir of conversation in the audience after his talk, with the Oregon beekeepers speculating about how this Georgia study could be applied to conditions in the Pacific Northwest, but to me this flurry of interest exposed a deep problem. Why aren't more of these extension-type studies being done, and even when they are done, why aren't beekeepers able to access this information easily?

You don't have to be a university scientist to figure this one out. There are a minuscule number of individuals in state/provincial governments who have the mandate to conduct this type of study and disseminate the results to beekeepers, and there are <u>no</u> federal beekeeping positions with this extension responsibility. Many of us try to fill the gap by squeezing an extension study into our already full research agen-

Continued on Next Page

"Ideally, we should have at least one individual in every state or province whose task it is to develop and deliver extension information to beekeepers."

das, or by putting on the occasional university short course for beekeepers. Overall, however, the resources are just not there to meet the needs of beekeepers. Ironically, the arrival of *Varroa* and tracheal mites into North America occurred during a time of diminishing research and extension resources, so that our ability to respond to honey bee pests and parasites has decreased as the problems facing beekeepers have gotten more severe.

Regulation is another issue in our industry that has fallen on hard times. We used to benefit from a comprehensive system of inspection and regulation, in which inspectors would come out, inspect our bees, and provide on-site advice concerning how to deal with disease and pest problems. Today, try and get someone to drive a few hundred miles out to your apiaries, provide direct instruction to you concerning how to monitor for *Varroa* and tracheal mites, and then demonstrate proper, legal methods for mite control. Some places have this service still. But not many.

There is a benefit to regulation that is not always recognized in our industry. At this Oregon meeting, I asked for a show of hands from all beekeepers who regularly were applying *illegal* mite treatments to their colonies, and about 25 percent of the beekeepers in the audience put up their hands. These, of course, were the beekeepers willing to admit it; there easily could have been another 25% in the audience who use illegal, non-recommended treatments without being as forthcoming about it. I'm sure I would have seen a similar show of hands at any beekeeping meeting across North America.

This is a serious problem for all of us, because the beekeepers using illegal treatments will be the ones who select for mite resistance, leaving us as an industry with few tools to combat the devastation that resistant mites will cause our industry. While none of us like to be regulated, the level of independence from regulation that currently characterizes the beekeeping industry may be dangerous to the industry as a whole. While everyone may not agree with this assessment, it certainly is an issue that should be more widely discussed.

We also need to consider the pervasive assumption that electronic communication will disseminate information. Computer-dependent information transfer has become an important tool for existing extension workers, and most beekeepers have or soon will have access to Web sites, CD-ROMs and electronic mail. However, these systems don't replace a person, and we still need extension workers to organize information and put it together in a user-friendly package. Computers also don't replace the benefits of person-to-person contact through courses, visits and lectures at bee meetings. Computers are useful gadgets, but a stand-alone extension service they are not.

I know what I would like to see, but I'm not sure how to make it happen. Ideally, we would have at least one individual in every state or province whose task was to develop and deliver extension information to beekeepers. This person would do some research, write clear extension bulletins, disseminate information via mail and electronically, conduct regular short courses throughout their jurisdiction, attend local meetings, put on field days, and make on-farm visits to beekeeping operations. Perhaps more than one person would be needed in areas where there is considerable hobby and commercial beekeeping.

I also know that this is unlikely to occur, at least if we expect governments to do it for us. The budget for such a service would be about $75,000 per year in each state/province, and more if you want it to be a really robust and active program. The costs could be kept down if programs were conducted regionally; there is little advantage to doing the same work in adjoining states. Extension information in Washington and Oregon, or Florida and Georgia, or Maine and New Hampshire, is not all that different, and regional cooperation could go a long way to reduce costs and increase the impact of extension.

In an era of funding cutbacks and diminished government involvement in beekeeping and other agricultural pursuits, we're just not going to see this done for us by government. Nevertheless, I see no reason why we in the beekeeping community can't fund this service ourselves if we consider it to be important. And, there is another advantage to beekeepers funding things like extension themselves: If you don't like what you're getting, you can hire someone else to do the work. Give it some thought and discussion at your next meeting. If extension is important but missing in *today's* beekeeping community, let's make it happen for the *next* beekeeping generation. BC

Mark Winston is a professor and researcher at Simon Fraser University, Burnaby, B.C. Canada.

A • TALE • OF 2 BEE DANCES

Tom Seeley

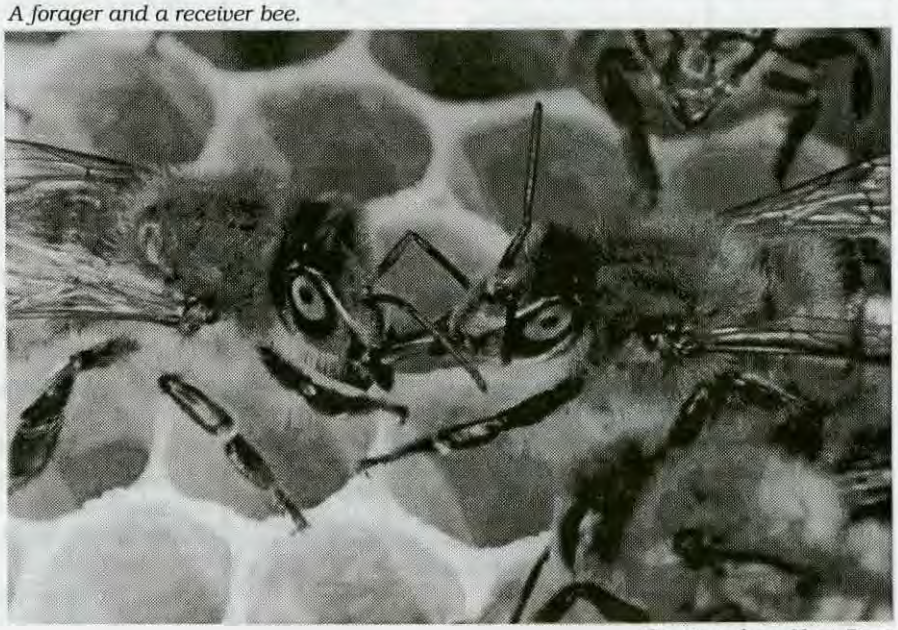
Several years ago, as part of my ongoing studies of the organization of food collection by honey bee colonies, I discovered that honey bee colonies possess a special communication signal between the nectar foragers and receiver bees, one which enables a colony to keep its rates of nectar collecting and processing in balance.

Perched on a hillside above my little house in upstate New York is a special hive of honey bees, one that I eagerly visit every evening from April to October. This hive is mounted on sensitive scales, and my nightly ritual consists of weighing the hive to determine how much food (nectar and pollen) the bees have collected from the flowers in the surrounding countryside. On most days, flowers yielding nectar and pollen are rather scarce, the colony has gathered little food, and I record in my notebook a weight gain of just one or two ounces, or maybe even a slight weight loss. But on some days – such as during the explosion of dandelions in May, the bloom of basswood trees in July, or the brilliant wash of goldenrod flowers in September – I register gains of several pounds a day. Most of these massive weight gains reflect the collection of nectar. On one glorious day in September 1992, for example, my colony of hard-working bees succeeded in gathering more than 27 pounds of goldenrod nectar. When ripened into honey, the net yield from this one day's labor was an impressive 11 pounds, which is as much honey as is contained in 15 of those plastic squeeze bears one sees in the supermarket. In general, nature does not provide a bee colony with a steady, dependable supply of nectar. Instead, the bees must cope with a boom-and-bust nectar supply whereby times of profuse nectar alternate with times of dearth.

This unpredictable variation in the nectar supply creates a severe organizational problem for a colony of bees. It is the problem of coordinating two distinct labor groups within a colony: the bees that work outside the hive *collecting* the nectar and the bees that work inside *processing* the nectar. The members of the first group, the forager bees, are among the oldest bees in a colony while the members of the second group, which I will call the receiver bees, come from the ranks of the middle-aged bees. These two groups interact in the unloading area just inside the hive entrance, where the receivers unload freshly collected nectar from the foragers and then either distribute it to hungry nestmates or concentrate it into honey and store it in the honeycombs, for processing must be kept in balance for the overall operation to proceed smoothly. If the collecting rate exceeds the processing rate, then foragers will experience long unloading delays upon return to the hive. Reciprocally, if the processing rate – or more precisely, the processing capacity – exceeds the collecting rate, then the receivers will be underemployed. Such problems of coordination associated with division of labor are not limited to bee colonies, but commonly occur in human factories as well, since the efficiency of any multistage production process depends critically upon the absence of bottlenecks in the flow of items from one stage to the next.

Several years ago, as part of my ongoing studies of the organization of food collection by honey bee colonies, I discovered that honey bee colonies possess a special communication signal between the nectar foragers and receiver bees, one which enables a colony to keep its rates of nectar collecting and processing in balance. This discovery was especially sweet because it also

A forager and a receiver bee.



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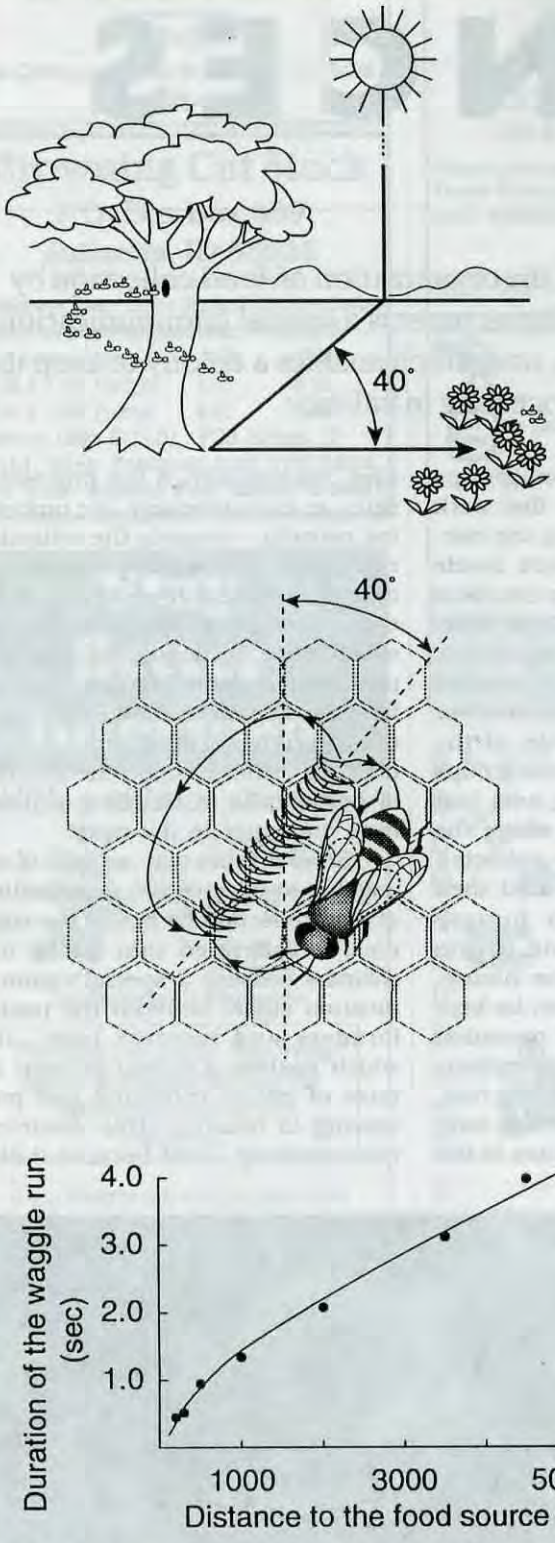

Fig. 1. The waggle dance of the honey bee. *Top:* The patch of flowers lies along a line 40° to the right of the sun as a bee leaves her colony's nest inside a hollow tree. *Middle:* To report this food when inside the nest, the bee runs through a figure-eight pattern, vibrating her body literally as she passes through the central portion of the dance, the waggel run. *Bottom:* The relationship between the distance to the flowers and the duration of the waggle run.

solved a mystery that was raised more than 70 years earlier by the great Austrian zoologist and Nobel laureate, Karl von Frisch, who in 1923, published his first major report on the communication dances of bees. In this work he described not only the famous waggle dance, by which foragers inform one another of the locations of rich food sources, but also another dance which he named the tremble dance. My translation (from German) of his vivid description of this dance reads as follows:

> At times one sees a strange behavior by bees who have returned home from a sugar water feeder or other goal. It is as if they had suddenly acquired the disease St. Vitus's dance (chorea). While they run about the combs in an irregular manner and with a slow tempo, their bodies, as a result of quivering movements of the legs, constantly make trembling movements forward and backward, and right and left. During this process they move about on four legs, with the forelegs, themselves trembling and shaking, held aloft approximately in the position in which a begging dog holds its forepaws. If they have brought home sugar water . . . often [they] will retain it until they have quieted down. The duration of this "tremble dance" is quite variable. I have seen instances where the phenomenon has died away after three to four minutes, then the bee appeared normal again and flew out of the hive. Usually, however, this dance lasts much longer, and three times I have observed a bee tremble on the combs without interruption for three-quarters of an hour.

The message of the tremble dance was a mystery to von Frisch, for although it – like the waggle dance – seemed to be a communication signal, he could neither identify its cause nor detect any effect on other bees in the hive, despite having observed more than 60 bees perform this dance. This led him to the tentative conclusion that the tremble dance gives the other bees no information. Some 40 years later, in his masterwork on the bees' dances published in 1967, von Frisch repeated this stark conclusion: "I think it tells the other bees nothing." At this time he also noted that several other investigators had reported that tremble dances seemed to be the result of foragers experiencing adverse circumstances outside the hive – such as a marked deterioration of their food source – and he suggested that the tremble dance might be merely an incidental effect of a "nervous conflict" in these bees.

In 1987, I began to suspect that von Frisch's conclusions about the tremble dance might be mistaken and that this dance might be an important signal in the organization of a colony's foraging. This suspicion arose from the unanticipated results of an experiment that I performed with a bee colony living in an observation hive. When I labeled and then removed most of the receiver bees from the colony and observed the effects on the colony's nectar foragers, I found – as expected – that the nectar foragers had to search noticeably longer to find someone to unload them upon return to the hive, about 30 seconds instead of the usual 10 seconds. I also found – to my surprise – that many of the nectar foragers performed a tremble dance upon return to the hive. Furthermore, I noticed that after about two hours, by which time the tremble dancing had abated, the foragers no longer needed to conduct lengthy searches to find food storers. Somehow

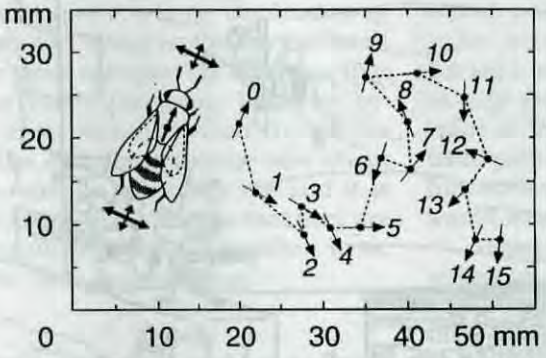

Fig. 2. The tremble dance of the honey bee. The bee on the left illustrates the strong side-to-side, vibrational movement of the body, while the diagram on the right shows the rotational and translational movements of the body. The numbered arrows on the right denote, at 1-sec. intervals, the bee's position on the comb and the angle of her body over a 15 second period.

the receiver bees that I had removed had been replaced!

These serendipitous findings led me to form a two-part hypothesis regarding the tremble dance: First, its *cause* is nectar foragers experiencing long searches to find receiver bees; and second, its *effect* is to stimulate additional bees to serve as receivers. In short, I proposed that the tremble dance serves to remove a bottleneck in the nectar acquisition process by signaling the need for additional receiver bees. In a non-manipulated colony, this need would arise not because of a drop in a colony capacity for nectar processing (there is no natural analogy to my removal of a colony's receiver bees), but because of a rise in a colony's nectar intake at the start of a honey flow.

Four years later, in the Summer of 1991, I undertook an experiment designed to test my hypothesis. I moved a colony in an observation hive to the Cranberry Lake Biological Station, which is located in the Adirondack State Park, in northern New York. The attraction of this site was that it is surrounded by nearly unbroken forests and lakes, hence there are very few flowers to provide natural food sources for the bees. I think of Cranberry Lake as "honey bee hell" and indeed no colonies of bees live here, except those that I introduce for my experiments. Here I can easily control the rate of forager traffic into a colony since the only significant source of food is the sugar water feeders that I provide, and with the help of assistants I can control the number of bees foraging at these feeders.

To test my hypothesis about the cause of the tremble dance, I provided a colony living in an observation hive with two sugar water feeders and regulated the rate at which "nectar"-laden foragers returned to the hive by controlling the number of bees visiting the two feeders. When this number was low, only 30 foragers total, these bees easily found receiver bees when they got back to the hive (on average, each forager searched only 10 seconds), and virtually all of them performed waggle dances. But when this number was high, 120 foragers total, they had difficulty finding receiver bees (on average, each forager searched 45 seconds), they ceased performing waggle dances, and instead they performed tremble dances. In general, I found that if a forager can locate a receiver bee within 20 seconds of entering the hive, then she will perform a waggle dance, but if she needs 40 or more seconds of searching for a receiver bee, then she is likely to perform a tremble dance.

To test my hypothesis about the effect of the tremble dance, I again regulated the rate at which foragers returned to the hive, but this time I counted the number of bees functioning as receiver bees on consecutive days of low and high forager traffic, hence on days without and with tremble dancing. Counting the receiver bees was accomplished by replacing the glass on one side of the observation hive with a stiff nylon mesh (tulle, the material used to make tutus for ballet dancers) and then daubing paint on the back of each bee seen unloading nectar from a forager. The effect of the tremble dancing was clear. For example, on July 9, 1994, when the forager traffic level was low (just three bees per minute entering the hive) and no tremble dances were performed, only 550 different bees functioned as receivers. But on the next day, when the forager traffic level was high (more than 25 bees per minute entering the hive) and more than 15 tremble dances were performed simultaneously within the hive, more than 2,000 different bees were functioning as receivers.

I believe that these discoveries about the tremble dance help deepen our appreciation of the inner wonder of a honey bee colony, especially the bees' social organization for making honey. We humans have long marveled at the way forager bees can share information about rich, far-off food sources by means of the waggle dance. We now realize that the effectiveness of the waggle dance in rapidly boosting a colony's nectar intake creates another problem for the bees, that of mustering sufficient receivers to cover the unloading needs of a burgeoning group of foragers. And we now understand that this problem is solved by means of a second dance produced by foragers when they experience excessive delays in unloading – the tremble dance. Maybe there is even a lesson here for us. Perhaps our banks, grocery stores and other places where customers must wait to be served should adopt a communication system like the bees' so that when long waiting lines develop the customers can call for additional tellers, cashiers and such rather than just quietly hope that more will appear. BC

Tom Seeley is Professor of Biology, in the Neurobiology and Behavior Section of the Division of Biological Sciences at Cornell University. He is the author of several books, the latest entitled "The Wisdom of The Hive."

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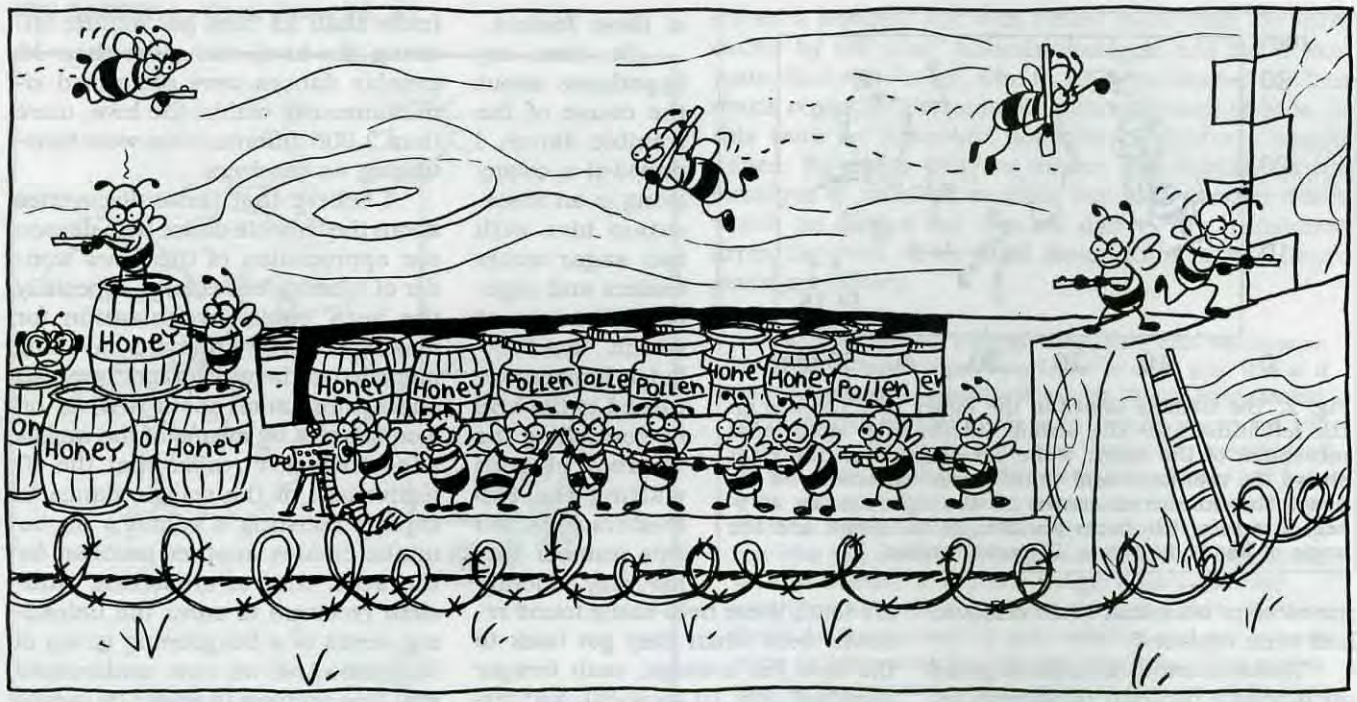

PROTECTION

Roger Morse

Bees Have Lots Of Ways To Stay Safe

It's often taught that large herds, flocks or groups of animals may suffer severely from the rapid spread of a disease from one animal to the next because they are crowded together. How then does a population of 10,000 to 50,000 honey bees survive in a hive where they are crowded and conditions conducive to spreading contagious diseases are present? The answer is that honey bees have a number of defense mechanisms that operate to protect them and their food and brood. Some examples of how bees do this are included here.

Propolis

Propolis is the name we give the gums and resins that honey bees collect and use to fill cracks and crevasses and varnish the inside of a beehive. Propolis eliminates places were noxious things like bacteria, molds, yeasts and other microorganisms might live. It is used to strengthen comb, and it also serves to waterproof the inside of the hive.

The stuff we call propolis contains several natural antibiotics. Some people think that honey bees add something to the propolis they collect that gives it additional power to kill bacteria and related microbes, but I have never seen any data to support this thought. And there really isn't any good reason why bees should add anything as propolis already contains toxic chemicals that give the inside of a beehive the same protection that these substances give a tree wound.

Some bees, especially those of the Caucasian race, may use propolis to reduce the size of their entrance, or, if they have multiple entrances, they may close some completely, especially those near the top of the hive. We presume this makes it easier for them to defend their nests against predators, though it may also aid in temperature and humidity control.

It is an interesting fact that honey bees may sometimes collect road tar, caulking compound and drying paint in place of tree gums and resins. But this is only because these substances have the same consistency and honey bees don't know the difference. After all, these substances weren't around on earth when honey bees evolved. These substances are all inert, and bacteria will not grow in or on them, so they too serve to protect the hive and its contents. The important point, insofar as the bees are concerned, is to eliminate places where microbes might hide and grow. The inside of a beehive is a mighty sterile place because of propolis.

Undertakers

There is a small group of bees that patrol the inside of a hive and remove the bodies of any bees that die there. These bees carry the dead out of the entrance and fly 50 to 200 feet away where they drop the bodies, which are then eaten by ants,

other insects and bacteria. The important point is to get the dead away from the living rapidly in the event the dead are carrying microbes that may infect the living. What we believe at present is that the bodies of the dead bees change odor about 30 minutes after they die and it is because of this change that they are detected by the undertaker bees, who then remove them.

Honey

Honey is very acidic. It has a pH of between 3 and 4 depending upon its source and treatment by the bees. It is its acid nature that makes honey a place where most bacteria, molds, yeasts and other microbes cannot grow.

Honey is made acid by the bees, who add an enzyme to it called glucose oxidase. This enzyme attacks a very small amount of the sugar glucose that is present and converts it into hydrogen peroxide and gluconic acid. Hydrogen peroxide is an unstable chemical and soon breaks down, but during the one to two days that bees are ripening and changing the nectar into honey, it gives it good protection. Gluconic acid is the chief acid in honey and gives it its low pH. Nectar contains little or no acid and would be soon attacked by microbes if it were not collected rapidly by the bees.

In addition to being acid, honey is a concentrated sugar solution with a high osmotic pressure. Microbes that are introduced into honey lose moisture and dry and die. Water passes out of their cells in much the same way as we lose water from our hands when washing dishes.

Pollen

Pollen stored in a beehive, like honey, represents a vast energy source that might be attractive to a number of microbes and animals. A special system to protect it has evolved over the years.

Honey bees add honey to the pollen they collect. This is first attacked by bacteria that eliminate the oxygen that exists around the pollen grains. This allows other bacteria that live without oxygen to grow and to produce lactic acid that turns the stored pollen into an acid medium that is unattractive to other microbes that might destroy it. There is insufficient honey mixed with the stored pollen for the gluconic acid in the honey to do the trick without the lactic acid fermentation. The lactic acid slowly destroys the nutritive value of the pollen so that overwintered pollen is not as good as a food, but without protection the pollen would deteriorate even more.

Honey bees fill cells containing pollen to only about 80 percent of their capacity. You never see a cell filled to the brim with pollen. If the pollen is to be consumed soon, the cells are left open. However, if the pollen is to be stored for several weeks or months, the rest of the pollen cell is filled with honey and capped. This seals the pollen cells, and the honey gives the surface of the otherwise exposed cell of pollen further protection against attack by microbes.

Royal Jelly

Royal jelly is the name given a substance produced by glands in the heads of worker bees. It is deposited in the cells of young worker larvae, who move in a circular fashion in their cells to consume it. It is also fed to developing queens throughout their larval life. It is the chief food of laying queens. Royal jelly contains some honey, and presumably the glucose oxidase in the honey gives the royal jelly some protection. However, it has been discovered that royal jelly contains a weak natural antibiotic that was found to be about 20 to 25 percent as effective as penicillin against test bacteria. The source of the material is probably the same as that of the royal jelly itself.

Cleanliness

Young worker honey bees (house bees) are constantly patrolling the inside of a hive and looking for work to be done. In addition to the undertaker bees, there are bees that are looking for other problems, such as cracks to be filled, offensive insects such as wax moths and pollen mites to be disposed of, and anything else that is not normal. These patrolling bees remove any debris they find and carry it outdoors. It is interesting to introduce small pieces of grass or straw into the top of an observation hive and watch how rapidly they are removed. It usually takes less than 30 minutes after they are introduced to see these foreign objects carried out of the entrance.

Temperature

Honey bees are one of the few insects that control the temperature of their brood nest, the name we give the area where the brood is reared. The data vary, but generally the honey bee brood rearing area is kept at about 96¡F. This allows the bees to grow their young in a specific period of time, but it also gives the brood and the adult bees protection. The heat is generated by the compact, growing larvae and adult bees that can generate heat by flexing their muscles. If the outdoor temperature turns cool for some reason, the heat is retained in the brood nest by bees that cluster around its outside perimeter. The clustered bees take the shape of a bowl or hollow ball around the brood and prevent most of the heat from escaping. If the temperature in a brood nest falls much below 96¡F, fungi, bacteria and microsporidians may infect and kill some of the brood. For example, chilling of the brood and the brood nest area is apparently what may lead to a chalkbrood infection in larvae and nosema in adult bees.

Apparently, a temperature of 96¡F is offensive to many microbes that thrive at lower temperatures. The effect may be compared to our own health and the fact that if one is chilled, he or she is more likely to be attacked by the common cold. Many of the microbes that have an adverse effect on plants and animals just sit and wait patiently for the proper conditions for their own development.

The cells in a honeycomb are in the shape of hexagons because this is the most efficient use of space and a way of keeping the brood rearing area compact. This, too, helps the bees control the temperature in the brood rearing area. Alternatives would be cells that are square or round, but cells of these shapes would have empty spaces around them and temperature control would be more difficult. The fact that cells in honeycomb are back to back adds to this compactness.

The Sting

Honey bees have stings that are barbed and that remain in the vic-

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PROTECTION ... Cont. From Pg. 25

tim when they are stung. Alarm odor is produced by glands associated with the sting, thus marking an enemy wherever it might flee. Unfortunately, a worker bee that stings usually loses her sting in the process. As it is torn from her body, a gaping hole is left, the bee looses blood in the process, and it is this that causes her death. Honey bees and other insects do not have blood that coagulates and serves to close a wound as does human blood.

The sting is a remarkable, effective, defensive weapon. In fact, it is so much so that usually fewer than 25 bees are guards at a colony entrance even in a colony with as many as 50,000 workers and large reserves of pollen and honey. Of course, these guard bees can release alarm odor that calls for help in a loud and clear way should the danger be great.

Nest

Our data show that only about 20 percent of swarms that leave a colony survive the first Winter. Some do not have the time necessary to build comb, rear brood and collect the food needed for Winter. But many fail because the homes they have selected are too drafty, too shaded, too wet, too large or too small. Our data also show that a nest about the volume of a single, full-depth, 10-frame Langstroth super is ideal. If the nest has a single entrance near its bottom, it is more easily protected. Nests five or more feet off the ground appear to survive better than those close to the ground.

Summary

Honey bees have an excellent system of physical and chemical controls that allow them to resist attack by a wide range of enemies. The system is far from perfect, and pests, predators and diseases, such as those that cause American foulbrood, European foulbrood, chalkbrood, sacbrood and mites, mice, birds, skunks and bears have slipped through, so to speak. Still, these natural systems probably serve to protect colonies, to at least some extent, against these problems, too. It has been observed, for example, that some skunks and bears will flee if they are stung excessively.

Not too many years ago, state departments of agriculture were more interested in helping beekeepers and other farmers. However, as fewer and fewer people devote themselves to agriculture, or are interested in it, we have seen a decline in this interest and attention. As a result, beekeepers are increasingly on their own in the control of the pests, predators and diseases that affect their bees, and a good knowledge of the natural mechanisms that control these problems is necessary.

Our modern beehives, made of three-quarter-inch thick lumber, give colonies good protection against extremes of temperature. Still, it is important to select good locations for apiaries so that the bees can make maximum use of their own natural defenses, especially as regards temperature control. Experience shows that apiaries that slope to the east or south, have a maximum exposure to the sun, have fresh water nearby, and are protected from the wind by a hill or woods are best. BC

TREATING HIVES

James E. Tew

A No Nonsense Approach To Disease Prevention and Control. Read This!

Honey bees certainly have their problems with pests and diseases. Honey bees hoard large amounts of concentrated carbohydrates and protein, they live in cramped, moist, quarters and best of all, they live in perpetuity. It's a great environment for a pest or pathogen.

If bees lost every battle with their specialized pests there would long since have been no bees. So obviously they do have some defensive measures that work reasonably well. Though predaceous mites have taken a great toll, honey bees are still in relative abundance. But judicious help from the beekeeper goes a long way in helping bees in their battles against some of these diseases and pests.

Broadly speaking, honey bees are affected by parasitic mites, bacterial diseases, fungal diseases, viruses, protozoa, and a host of predators such as wax moths and bears. Other than possibly requeening, you can discard from the list viruses and fungal diseases as problems with which the beekeeper can do little to assist. There are simply no adequate controls for these maladies within beekeeping at this time. That leaves bacteria, protozoa, mites, and other pests as areas appropriate for beekeeper assistance. Dealing with pests such as bears, skunks, toads, or birds, requires specific control measures that are outside the scope of this article. Though all threats to the colony's good health should be addressed, the most common problems, American Foulbrood and predaceous mites (Varroa and Tracheal mites) should be given the most consideration.

Treating bee colonies for various pathogenic problems can be, at once, both helpful and potentially hurtful to the hive population or possibly to the future honey crop. There are many variables that must be considered when developing broad scientific recommendations for disease and pest control and those considerations must be reviewed over a period of years and under different environmental conditions. It's not a quick procedure. In most cases, for statistical analysis to be relevant, untreated hives must actually be allowed to die, if necessary, to conclusively show that a treatment is effective within the treated population. Beekeepers have been warned time and again that looking for serendipitous treatments that are poorly researched is a risky procedure for the beekeeper, the bees, and the honey crop. Even if recommended and approved treatments seem to be increasingly ineffective, a beekeeper would be wise to stick with tested and documented control procedures.

American Foulbrood.

Description and Spread The disease called American Foulbrood, or AFB, is caused by the bacterium *Bacillus larvae*. (There is a new name for this disease. Since it is not yet widely accepted we will use the more familiar name.) AFB has plagued both bees and beekeepers from the earliest days of U.S. beekeeping. *Bacillus larvae* is a spore-forming bacterium. Spores are extremely hardly and can survive in dormancy for thirty-five years or more. Spores are easily transported by either infested bees or infected equipment. Beekeepers moving contaminated equipment are, by far, the greatest source of AFB spread.

Symptoms Visual signs of AFB begin to show up in the hive after young, susceptible larvae eat the spores that have been mixed in the brood food fed by nurse bees. If left untreated, infection spreads rapidly until the colony population is so weakened it dies during cold months by the ravages of the wax moth, of just by sheer lack of population, since all larvae die.

Symptoms of American Foulbrood

1. Brown, decaying prepupa or early pupal stages
2. Spotty brood patterns
3. Punctured, ragged often sunken cappings
4. Musty decay odor (somewhat like sour, wet boots)

Symptoms of American Foulbrood that are Occasionally Present

6. Dead brood with the tongue sticking up from the carcass
7. Mucilaginous consistency of some pupae that will sting out about an inch when punctured
8. Dried pupal skins, in the form of a brittle scale, stick to the bottom sides of infected cells (difficult to see)

Treatment Burning infected equipment and destroying infected bees is the only way to completely eradicate AFB. Though effective, total colony destruction is a radical recommendation. Presently, oxytetracycline hydrochloride (Terramycin®) is the only approved antibiotic for controlling the growth and development of *Bacillus larvae* within the gut of the larvae. It does NOT kill spores, therefore the disease may re-express itself shortly after antibiotic applications are stopped.

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GENERALIZED TREATMENT SCHEDULE FOR HONEY BEE DISEASES AND PESTS

For Honey Producing Colonies in Temperate Climates

Season	Indicator	Treat For	Comments
Late Winter	1st Pollen Source	*Varroa*, AFB, EFB, Tracheal Mites, Nosema	• No supers on • Nosema treatment secondary to Fall treatment
Spring	Fruit Bloom, Spring Flowers	*Varroa*, AFB, EFB, Tracheal	• No supers on
Late Spring/Early Summer	Clovers, Spring Flowers	Tracheal Mites	• Supers on • Tracheal treatment with vegetable shortening year round
Summer	Clovers	None (emergency *Varroa* treatment	• Supers on (remove for emergency treatment
Late Summer/Early Fall	Golden Rod, Asters	AFB, Tracheal, *Varroa*	• No supers on
Fall	Asters	Nosema, AFB, *Varroa*, Tracheal Mites	• No supers on
Winter	None	None	Prepare for Spring

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Treatment Doses Stop all antibiotic treatments six weeks before the nectar flow starts. It is important to confirm dose recommendations with your state apiarist. Dose rates and recommendations may vary from state to state.

1. Terramycin/Powdered Sugar Mixture: Mix one 6.4oz package of TM25 with 1.5-2.0 pounds of powdered sugar. Place this mixture on the tops of frames, along the outer edges of the brood frames. Usually, three dustings at 4-5 day intervals is considered to be one treatment per hive. You can retreat when all this dust has been consumed. Stop all treatments six weeks before surplus honey supers are added.

2. Antibiotic Extender Patty: Mix 1/3 pound of vegetable shortening (e.g. Crisco) with 2/3 pound granulated sugar. Add two tablespoons of TM25 to the mixture. Press into two half-pound patties and place on colony, on the top bars of the brood frames. Place between brood chambers if using two. Remove at least six weeks before adding surplus honey supers.

When to Treat Early Spring before supers are put on. Actually, treatments can occur any time that surplus honey is not being produced. So, if you discover an outbreak in Summer or Fall, remove honey super and either dust or use a patty. Losing a colony is probably more expensive than losing a portion of your honey crop.

European Foulbrood

Description and Spread Essentially, European Foulbrood (EFB) is the little brother of American Foulbrood. Another bacterium, *Mellisococcus pluton*, is credited with causing the symptoms associated with EFB - though other bacteria probably play a role. The major difference between the two brood diseases is that EFB does NOT produce spores; therefore, its persistence and effect on honey bees is greatly reduced when compared to AFB. Though described as early as 1771, not very much is known about EFB. No doubt it is spread by both drifting bees and beekeepers. EFB attacks colonies in mid to late spring and has been occasionally called a stress disease. EFB is not normally considered to be serious, but since it resembles AFB, it should be treated with care.

Symptoms Infected larvae usually die in the coiled larval "C" shape while larvae infected with AFB die stretched out. Initially larvae are yellow before changing to brown and eventually changing to black.

Symptoms Of European Foulbrood
1. Spotty brood pattern
2. Twisted yellow-colored larvae
3. Sour, somewhat putrefied odor
4. Larvae dries to a rubbery scale
5. Watery body fluids

Symptoms of European Foulbrood that are Occasionally Present
6. Larvae dying in the extended position
7. Mucilaginous stringiness usually less than one inch

Treatment and Treatment Doses Treatment is the same as for AFB and on the same time frame, generally in late Winter or early Spring

***Varroa* Mites**

Description and Spread The arrival and establishment of *Varroa* mites (*Varroa jacobsoni*) in North America is now historical fact. Within the continual U.S., there are no areas considered to be *Varroa* mite-free. Originally, the mite was a parasite on *Apis cerana*, the Asian honey bee. By inadvertent beekeeper spread, the mite is presently found throughout the world except for New

Zealand, Australia, and Hawaii. Its first detection in the U.S. was in 1987. Varroa is a large tortoise-shaped mite that is colored rusty-red. The mite is a bit less that 1/16" across and is easily visible with the unaided eye.

Symptoms Initially the presence of Varroa is unnoticeable in the hive. Several months to several years may be required for mite populations to built up enough for them to be easily seen. By that time, both the adult and brood population is heavily infested and colony's death can occur rapidly.

Symptoms of a Varroa Infestation Colonies dying with abundant honey stores is a strong clue that Varroa mites were present in high numbers. Wingless or deformed bees that are either dead or maimed are also symptomatic of Varroa infestations. In such cases, mites can usually be found under the cappings enclosing larvae. Beekeepers within the continual U.S. should assume that Varroa mites are present within their colonies. Approved treatments should be initiated on a regular basis.

Treatment Use one Apistan strip (Active Ingredient - fluvalinate) for each five combs of bees or less in each brood chamber. Hang strips within two combs of the edge of the bee cluster (not necessarily the edge of the super). Apistan strips must be in contact with brood nest bees at all times. For best results, use strips when daytime temperatures are at least 50°F. Presently, there are no other legal treatment materials for *Varroa* at this time.

When to Treat Treat in the spring before honey supers are put on and in the fall after supers have been taken off. Leave strips in place 42-56 days (6-8 weeks). However, you should be monitoring your colonies throughout the season. If, during the Summer you find, using a ether roll, more tha five mites, you should seriously consider sacrificing your remaining honey crop and treat immediately. Again, losing a colony is more expensive than losing a partial honey crop.

Tracheal Mites

Description and Spread Tracheal mites (*Acarapis woodi*) are microscopic and live within the honey bee's respiratory system (predominately the prothoracic spiracle). They were first described in England in 1919 and were not found in the U.S. until 1985. Research and development of information concerning the effects of Tracheal mites have been given secondary status while control stratagems for Varroa have been developed. There are differing opinions as to how much of a threat tracheal mites are to U.S. beekeepers - especially for those who keep bees in warm climates.

Symptoms Infected colonies have dwindling populations, do not cluster well, and often die in the winter (February and March), frequently leaving behind large amounts of honey. Infested adults may act irritated or disoriented. Weak adults may be found crawling aimlessly near the hive entrance. Microscopic examination of the bees' respiratory system is required to conclusively show the presence of the tracheal mite. Authorities disagree as to the seriousness of the effects of tracheal mites on honey bees. Simply finding tracheal mites within the dissected bee does not always mean that disease symptoms will be expressed within the colony.

Treatment Two materials, vegetable oil patties (Grease Patties) and menthol, are useful in suppressing tracheal mite populations.

(1) Vegetable shortening patties. Mix solid vegetable and sugar in a 1:2 ratio. The patty should be about the size of a hamburger patty (about 1/4 pound), and placed as close to the center of the brood nest as possible.

When to Treat with Grease Patties Treatment with grease patties can be continuous. (If Terramycin is added to control American foulbrood, patties should be taken off six weeks before surplus honey production.)

(2) Menthol Treatments. A 1.8 oz (50 grams) packet of menthol crystals in a porous bag (usually supplied) per two story colony, is put on in the spring or secondarily in the fall. Leave the packet on for 14-28 days with the entrance reduced. If it is above 80°F, put the packet on the bottom board. Below 80°F, place the packet on the top of the brood nest. Menthol vaporization can be erratic and may require fine-tuning in different areas.

Nosema Disease

Description and Spread Nosema is caused by the protozoan, *Nosema apis*. Nosema infections have been compared to high-blood pressure in humans. It may be within a colony's population for years but may not express any symptoms. Cool, wet spring seasons seem to aggravate the development of latent Nosema. Beekeeper manipulations and robbing or drifting bees are the primary means of the spread of Nosema. *Nosema apis* is a spore-forming protozoan.

Symptoms Extreme fecal markings on the hive's exterior is a common indicator of Nosema. However all dysentery infections are not due to Nosema. Bees, with swollen abdomens and unhooked wings, crawling in front of a fecal-spotted hive are general indicators of Nosema - though those symptoms could also indicate other non-related problems. Internal examination of the infected bee would be required to tell if Nosema is the causative agent.

Treatment The antibiotic Fumadil-B (fumagillin) gives excellent control of Nosema. Fumadil-B should be mixed in cool sugar syrup at label rates and fed as early in the Spring, and again as late in the Fall as possible.

Unfortunately, there are other diseases that commonly occur, for which there is no control. Currently, no chemical controls are available for the viruses causing sacbrood and bee paralysis. Also, the common fungal disease, chalkbrood, has no chemical control. BC

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QUEENS

Kim Flottum, et al

Nearly 300 people gathered to hear 15 experts talk about queens, queen production and queen use at the ABF Convention

During the past two or three seasons the number of comments reaching my office on queen performance have increased dramatically.

This doesn't mean all queens, queen producers or beekeepers have messed up, since there has always been some small contingent of each of these groups that have had trouble. It's just that lately there seems to be more than usual. Enough to draw my usually too-scattered attention for more than a moment.

So, after talking to a great number of people with more questions than answers, I posed the question on these pages last year. The result was phenomenal. It's gratifying to get a response to a question posed, but unsettling when you don't have the answers. So I posed the question to the American Beekeeping Federation and suggested they address this at their January meeting. They agreed.

Actually, they agreed to let me go ahead and put something together. So we contacted a variety of people who had a range of experience in this. Here's a list:

Marla Spivak, Professor & Extension Specialist, University of MN
Jeff Pettis, USDA Beltsville
Eric Mussen, Extension Specialist, UCDAVIS
Jennifer Finley, Research Specialist, Penn State
Danny Weaver, Queen & Package Producer, TX
Reg Wilbanks, Queen & Package Producer, GA
Pat Heitkam, Queen Producer, CA
Tom Glenn, Queen Producer, CA
Gus Rouse, Queen Producer, Hawaii
Dave Miksa, Queen Producer, FL
Tom Hamilton, Commercial Beekeeper & Pollinator, ID
Jim Doan, Commercial Beekeeper & Pollinator, NY
David Hackenberg, Commercial Beekeeper & Pollinator, PA
Medhat Nassar, Researcher, Guelph, Ontario
Sue Cobey, Researcher, OH

Geographically we covered the country, and we included queen producers and queen users, along with scientists. You probably recognize many of these names.

Then, we let them do what they do. The Extension people detailed what they had been seeing in their various locations, which covered even more than the phone calls I've been receiving. We let the audience have a say, too, and they added even more to the story, with more real world experiences.

Putting all this together we came up with a collection of problems encountered. Some, admittedly, have always been here, and probably always will be. But others were new, undiscovered, unexplained, and for some, absolutely unreal.

> "The real world of mail delivery received lots of attention. It is an unknown at the moment."

We made a list of what was mentioned by everyone and I'm sure that you have seen, or at least heard of some of these problems. The first step in solving a problem is identifying it.

Problems identified covered a variety of behaviors relative to egg laying. These included queens starting strong then quitting after only one or two brood flushes. Sometimes she would start up again in a month or so (this assumes, of course she wasn't superceded), sometimes she never did. Interestingly, some colonies, when confronted with this behavior did not supercede. At all. Ever. Others never quit replacing the queens they produced or that were introduced. The outcome of all of these was that colonies either never took off, or (in the exact words of the symposium) pooped out shortly afterwards.

Commercial beekeepers noted that queens just didn't last as long as they used to. A queen, according, to some, should (or had in the past) last a year plus. Lately, they weren't around more than five or six months. Not good.

Another major problem encountered was the affect of the mites – both mites – on the colony as a whole and queens in particular. Drones, however, are equally or even more affected by *Varroa* mites it seems, since they are so much more attractive. (A fatal attraction?) Drones that have been attacked by *Varroa* are less virile, less vigorous, less long-lived and less almost everything than their unattacked counterparts. And, unless a *Varroa* infestation is incredibly heavy, it's difficult or impossible to tell, just by looking. So, it seems, a queen breeder may have drones, but they may be duds.

Tracheal mites attack queens just like workers, and in the same one-four day old time frame. Producers who aren't treating for mites could be opening the door for sending queens out already infested with these pests.

A whole list of similar problems came up involving queen cages, the candy in them, and the shipping environment between producer and consumer.

Queen cages have changed since the days the two-hole Kelley cage dominated the market. Invented, essentially, as a two-hole before the turn of the century and made popular by the A.I. Root Company, the cage went from two to three holes within a couple of decades or so because of the improved shipping it allowed.

Within the last decade, several new changes have occurred. Plastic cages, small wooden cages and smaller two-hole cages have come on the scene. Coupled with these has been the learning curve of queen catchers, and queen consumers in dealing with these. Smaller space inside, and packing then in battery boxes (which in turn are packed tightly in shipping vehicles) has also changed the queen's environment. For the worse, perhaps.

Receiving much attention, too, was what could be happening to queens after they arrive, which falls right in the hands of consumers. But first, let's go back to producer basics. It all starts there, and as long as we're looking at fundamentals let's start with those things queen producers can perhaps attend to, to produce better queens.

Every producer probably believes they have the best breeder stock in the world. Too often, however, the theory of "pick the best and hope for the best" is used rather than a continuous upgrading each year. An analogy would be that if when vegetable breeders want to register a new variety of, say, a green pepper, they must show it is 'at least' as good in several major areas (vitamin content, disease resistance, hardiness) as any other already on the market. If not, they don't get registered. So too should queen producers strive for 'at least' as good. Measurably better every year is even better. And, if queens are sold in Ohio, Georgia and California, they better be 'at least' as good in every location. Breeding a 'northern' queen, and selling it in the south, or vice versa, should not only be discouraged, it should be outlawed. But it won't be.

After breeder selection comes production – no easy task. Right-aged larvae, weather, comb environment (humidity control), the right (and healthy) queen cell cups, and especially nutrition – probably the most important, and most underrated part of the game. Colonies that support breeders, cell starters and finishers, mating nucs and absolutely in every drone producing colony need better than 'average' nutritional status.

Pollen, pollen supplement and pollen substitute, plus lots and lots of nectar every step of the way. You can't stress, even a tiny bit, any colony involved in this process. Do it, and you and your queens will suffer, and you end up with unsatisfied customers. Or no customers.

Next, in every one of these colonies mites and diseases must be controlled. Remember the comments about tracheal mites and new queens, and *Varroa* and drones? Also, queen producers in the south who don't treat for tracheal mites because they're not a problem *there*, are doing their customers up north a *great* disservice. And so much for anything approaching a quality

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"What are these virgin queens exposed to, in an old mating nuc with 10-year-old comb?"

control program. Yes, it costs. But lost customers cost more.

So far, nutrition, diseases and predators are under control . . . right? Healthy nurse bees, healthy drones, healthy queens – both virgins and newly mated – so what's next?

The mating game is next. This, at our symposium gained a lot of attention, and here's why.

All the past research has shown that you need at least 15 drone colonies for every queen mating nuc. That's a 15:1 ratio. Now, let's look at what's happened over the past few years that's affected this drone to virgin queen ratio.

First, in the past, producers who supplied this many drone producers (assuming they made that large of an investment) made the assumption this was correct. And, all things considered perhaps it was. But let's consider all things for a moment. Years ago, there were more bees. There were feral colonies out there. There were other beekeepers out there. More bees, everywhere. This a case for drone comb if there ever was one.

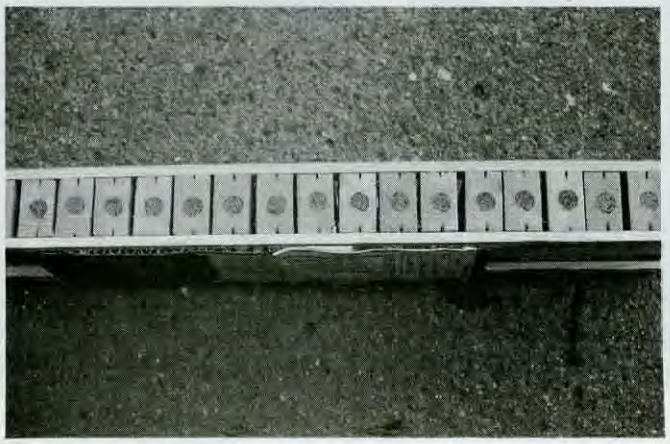
Also, the health of the drones that were there was probably better. *Varroa* has certainly taken some toll, viruses associated with *Varroa*, too. And of course any feral drones will be similarly affected.

Given these changes, the placement of drone colonies in mating yards has become more crucial. This has probably not been a priority for some, perhaps high for others. It is a necessary ingredient.

So, drone numbers, drone health and drone locations have all changed – for the worse from a consumer's point of view – and all of these can, and probably have led to some of the problems mentioned.

Another, probably less important consideration is that with fewer drones from fewer sources, the genetic base begins to shrink. Considering that at least a 1:15 ratio is required for good mating, how many outside queen or drone sources must be brought in to avoid inbreeding and other too-close problems?

Is this the best way to ship queens?



Let's revisit one of these disease problems again – nosema. This is an insidious and nearly undetectable problem, but it is deadly in a queen producing outfit. Queens exposed to nosema in mating nucs will mate, but are so often superceded once introduced that you can not only count on it, but very nearly predict when after introduction in your colony it will occur.

Nosema then reduces queen acceptance, but, once introduced into a colony, begins to reduce production there, too. A double edged sword so easily avoided. This doesn't even consider what it's doing to these bees in mating nucs, does it?

Then, comes collection. Are these queens collected on days that catchers need to wear coats because it's cold? Or shorts because it's hot? What temperatures are these brand new queens exposed too so early in life? Hold that thought for a moment.

Speaking of exposure, let's consider the internal environment of these mating nucs. These tiny (usually) colonies are exposed to a variety of drugs and medications – fumidil (we hope), terra, menthol (maybe), Apistan, grease patties . . . all the 'legal' stuff. After awhile the comb in these colonies will reflect the history of this exposure. How much ends up in the wax? Any? Some? Lots? And what affect does this have on those brand new virgins, or when they're first mated? Nobody knows. Somebody should. At the least old combs should be rotated out, routinely.

Back to the temperature thing. Queens are collected and brought back to some central area. Hot in the truck, or too cold? Piled up and overheated on a bench, when the sun moves around through the door? Or chilled just a bit in the cab's air conditioned comfort, or the bosse's office?

Queen banks? Done well they serve the perfect purpose. Done wrong and you might as well kill them outright. Lots and lots and lots of young bees, everyday or two, at least. And lots and lots of food, lots and lots of food. Continuously. Constantly. Every day, all day. Pollen, nectar and all the right medications. Remember nosema? And what about queen cages? Are they perfectly secure? No chance of damaging the queen's feet, or antennae? A damaged queen, however so slight, pretty much has a death warrant when introduced to a new colony.

And then there's the mail. Queens sent out in packages probably have a better change than those sent alone. They have food – at least for awhile – and a fairly consistent thermal regulation organization – pounds of bees. It's those who travel alone that run the greatest

risk. Consider that risk. Those little post office trucks, that can get really hot, start the journey, unless the producer takes the extra step and delivers them personally.

Then they enter the real world of mail delivery. Most are sent air mail, or priority mail. Many spend time in an airplane, in the cargo area. Air pressure is a factor here, as is temperature. What, exactly, does cold temperature and reduced cabin pressure do to a brand new queen? Or, to a battery box of 100 queens – those on the edges, and those in the middle? Who knows? According to those at the symposium, nobody. And, once arrived, does she sit in your mailbox until you get home from work? These all add up.

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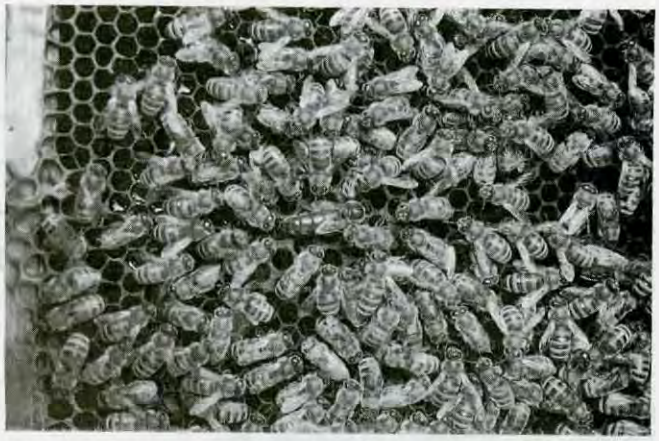
We looked at some of the things queen producers should be thinking of, and doing, to reduce problems with queens. This is the time of year they should be thinking of them. Some things, of course, should have been dealt with before now. Let's hope they have. And, as a consumer, you should be asking which of these is under the producer's control, and, of those which are controlled.

There's another great black hole of problems that need to be considered – those dealing with what happens to that queen *after* she leaves the mail stream and comes home. What is it that the consumer can do, should do, must do to ensure success?

That, we'll explore, next time. BC



This queen is 'apparently' healthy. What happens in six weeks?

The information in this article was taken from a white paper written by Marla Spivak and Jeff Pettis presented at the Honey Bee Queen Symposium held at the 1998 American Beekeeping Federation meeting, and comments made by the participants and members of the audience.

Setting Up A NUC OPERATION

Part I: The Planning Stage

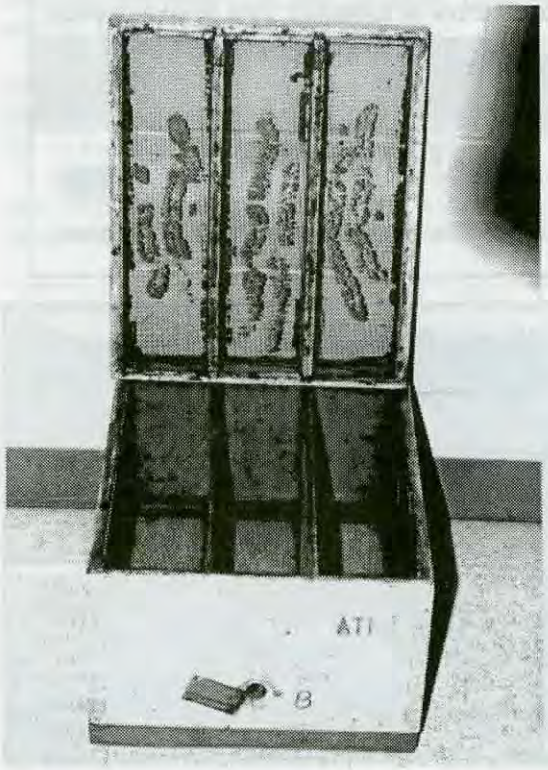
Michael Meyer

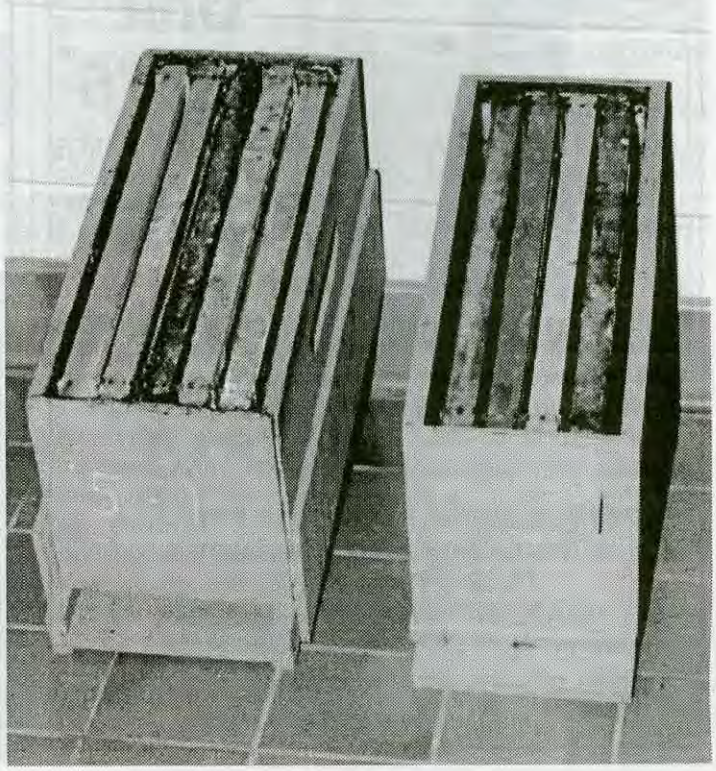
The planning segment of developing a successful nuc operation for the small-scale operator (around 50 colonies) asks many questions, but that is the way with the planning part of any successful operation: Get the questions out in the open and look at the big picture, so you don't get lost later on. Generally answers are easy, but the specifics of each individual operation will determine most of answers you'll need for your operation. Obviously, a short article cannot cover all the questions nor cover all the operational variances encountered in beekeeping. So if you have more or fewer hives than our theoretical 50-colony operation, or if your equipment differs substantially, you'll have to make modifications, but that is to be expected.

This article was prompted by the post office's proposal that a huge increase in special handling fees on package bees looms in the future. If this increase occurs, the price of a single 3-pound package could be over $60 delivered, which would discourage many from starting beekeeping or expanding their own operations. This increase may go into effect for the 1999 shipping season, so ynow is the time to start planning a nuc operation. Why sell nucs at all? The first obvious answer is for extra income. A second answer is for swarm control. Two more not so obvious answers would be, first, to keep your brood frame replacement schedule on track. Brood frames should be replaced routinely or as they darken to, or past, the chocolate brown stage. The second answer is that selling nucs in your area will establish a customer base for additional supplies if you sell them, establish possible honey customers, and establish a base or pool of names for part-time help if you need it.

Let's explore some possible scenarios as they pertain to nucs and income. How many nucs can you produce with 50 colonies? A good rule is the the 80 percent rule, that is, allowing for certain things to go wrong and that your own operation will need some of these nucs, you should be able to produce 40 good nucs from 50 hives every four to six weeks. This depends on the weather

How will you raise your nucs? Several to a large box, or individually?





and stimulative feeding certainly.

Now, talking in general terms about your margin which may be leaner or fatter than what I describe will at least give us a benchmark to start with.

Let's assume you buy queens for the first round of nucs produced to stay competitive, time-wise, and that your frame replacement costs are also standard. As a start charge $40 for a nuc, back out $12 for a queen, another $6.00 for four frames and foundation, a $1.00 for gas and driving, $2.00 for depreciation and repair on your nuc boxes you would realize a net of $19.00 per nuc, a 30 percent cost of goods. But several less tangible gains remain to be counted since these nucs helped control swarming and increased honey production. Plus good management dictates that two frames get replaced anyway so your net might be closer to $30 - $35 per nuc, assuming all your queens were accepted. So, your 50 hives could generate $760 - $1400 net, way before the honey flow.

The next question is: Buy queens or raise your own? The most profit dictates raising all your own queens, but you'll have trouble meeting the early demand for nucs, which is 50-80 percent of your total sales. A better plan is to buy queens for the first round of nucs, and raise queens for all nucs after that, including overwintered nucs. This assumes you have the knowledge, time and special equipment to raise your own queens. Techniques for queen raising are available from a variety of sources and cannot be covered in this article.

You will get nuc sales all Summer and into early Fall if people know you have them, so you plan for these sales. I recommend several sources for queens, but the race or hybrid is up to you. Do you want to offer your customers a variety, or stick with a certain kind only? Although your nucs may start out as your bees, they will quickly adopt the characteristics of the queen you introduce. Get references if this is a new breeder for you, and become familiar with the techniques and equipment needed for 'queen banks' and how to keep your queens in optimum health for several weeks after they arrive – more later.

Another extremely important question is availability and timing. When will your nucs be available? A good rule of thumb is within three to four weeks after most beekeepers in your area start receiving packages. Don't worry about being later than packages, since a 3-pound package takes about a month to equal the bees and brood in a four-frame nuc. Some education of customers on this fact is always in order.

The next set of questions revolves around the physical parts of the nucs themselves. Nucs are generally sold with three-, four- or five frames. As with most things, with variety comes headaches. Simplify, and you'll lose some potential customers, but your life and schedule will be easier. Now, for a standard or definition – what exactly is a three-frame nuc? Obviously, it has a queen and three frames, but what is on those three frames? Three full frames of sealed, wall-to-wall brood? Two frames brood with one frame honey? How much brood, percentage-wise, qualifies a frame as a 'frame of brood'? Should the nuc be bursting at the seams with bees? Or just have a healthy, *normal* amount? What is a normal amount, anyway? Will you just have deep-frame nucs or offer some medium-depth ones? Will the price be different? How about your 'nuc boxes'? Will these all be five-frame so you can accommodate three-, four-, and five-frame nucs? Will these be single hives converted into two-way nucs? Or will you use disposable nuc boxes? Will you charge a deposit on these? When you take frames out of your parent hives, will you have replacement frames made up and ready to go in? How far will you deliver nucs? What will be your dealer price (delivered)? How will you work the transfer of nucs from your boxes to customers' boxes? What days? What day and time of day can customers pick up their nucs once the nucs are transferred to the customers' boxes? If they leave empty boxes off at your place, where will you put those boxes? What if someone steals the customer's box? Will you have a convenient holding yard for the finished nucs? Far enough from their previous yard so that the field bees don't drift back? Do you have to get inspected to sell nucs in your state? Will each nuc come with an Apistan strip(s)? How can you identify individual customers' nuc boxes? Do you have the customer's phone number when his or her nuc is ready? Will you take checks? What if someone gives you a bad check? What if a customer brings drawn comb which you later (after it has been in your beeyard a while) identify as having AFB scales? Will you burn their frames? Will you charge them extra? Or cancel their order? These are all real-life situations I have encountered over the years, so be prepared.

Can you raise your own queens, or will you need to purchase them?

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NUC ... Cont. From Pg. 37

Next is pricing. Will your price or prices include frame exchange? Will that be foundation only, drawn comb only, or mixed? New frames or recycles? Any type of foundation? How about foundation improperly installed? Examples of this are 'holes up,' sagging wires, no wires, not enough wires, wavy foundation, foundation not attached, broken foundation . . . Whew! Will you guarantee your customers the combs will be no darker than _____? Or does it matter? If you can guarantee light combs (ones with more longevity), should your price be higher? Will each nuc get an Apistan strip? Will you be strictly retail, or will you have a wholesale price to a dealer? Will you have a quantity discount to a customer who buys more than _____? Again, these questions will arise if you sell nucs long enough. (Your first year may be long enough!)

The last part of this operational planning involves late-season nucs, those made sometime during the Summer. Will you raise all your own queens for these? Queens after certain dates, generally late May or June are cheaper, but still cost more than raising your own. Do you have time to raise your own? Does your 'regular' job interfere with the 10-day emergence schedule? Can you install cells with a flashlight? In your area, what is the date for the last nucs to be made without jeopardizing the integrity of the parent hives? How many nucs can be made from each hive without cutting into the honey flow? What if the honey flow doesn't matter? Do you have a feeding system in place for both nucs and parent hives? How large should you leave parent hives with only ____ weeks until the traditional start of the honey flow in your area? How will you Winter these nucs? Above colonies, on their own, combined into duplex hives, or stacked up and wrapped? Will you sell these overwintered nucs or nuc them at a date later than your parent colonies? How will you market your Summer nucs and will they be the same price as your early ones?

Finally, what about customer complaints. Will you take deposits on nuc orders to insure payment? What if your nucs are weeks late and customers cancel their orders? What if a customer says your nucs are not as advertised? What if they bring you a dead, single hive weeks later and say their nuc died? What if it is months later? What if their nuc develops any one of a number of serious diseases and they blame you? What if they write an incriminating editorial pertaining to your nuc quality, timing or business practices? Do you still want to sell nucs?

Actually, most of these will never happen, but they could. Most customers are novices and won't blame you if their nuc doesn't make it. Most act as great word-of-mouth referrals for your benefit. But you should have a plan should any of these problems arise and be prepared to deal with them.

Part two provides answers on the logistics these questions raise, and gives common sense, practical guidelines for creating a smooth, quality-oriented operation in your area. The opportunity is there; all you need to do is seize it. BC

Michael Meyer is a commercial beekeeper who pollinates, produces honey and sells nucs from his home in Springfield, Missouri.

BEE CLUB ACTIVITIES

Any club can do some, or all of these activities. Mostly though, it's talking about bees . . .

Don Jackson

In the first two parts of this three-part series, I outlined an enjoyable and valuable activity of our local bee group – setting up a club apiary that could demonstrate all aspects of beekeeping and get us all involved in whatever phase we felt we could help others with or needed to learn more about. The hands-on approach has been a real boon to the beginners, and expert guidance by the experienced beekeepers yielded a level of know-how not normally available to most people. Furthermore, the fact that this was a club apiary, with group ownership, gave all a sense of participation and possession that would otherwise not be possible. The psychological advantage of this approach lends itself to trying more things, asking more questions, and caring for the apiary's success because we all can profit.

I'd like to tell you more about our bee group. A lot of areas of our country do not have active clubs, and that's unfortunate. Beekeepers like – and need – a chance to "talk shop" about their bees, their bee problems, the honey markets, and the character of each year's weather that affects beekeeping in seasonally unique ways. Our club tries to be open to everyone, both beginners and the more advanced, both the hobbyists and the commercials. We think that is the way it should be. . . . Some clubs are nearly the exclusive stomping ground of big outfits, not a healthy atmosphere for the future of beekeeping in America and not a good way to prepare the next generation for the future. It's wrong when a commercial beekeeper comes up to you and the first question he asks is, "How many colonies you got?", then proceeds to boast about his own enterprise or walks away from you because you are "small potatoes." Don't misunderstand me . . . I'm a commercial beekeeper myself, but I believe that a healthy atmosphere and a healthy club will have a generous mixture of both large and small operators, with a fraternal and decent state of mutual respect throughout.

We learned how to raise queen cells . . . (Rose Zak photo)

While some bee clubs meet three or four times per year, many, like ours, meets monthly. We have to meet often because our membership is large and some of our meetings are attended by more than 50 people. The club also does a lot, and I assure you that the frenetic activity of running a demonstration apiary is only one of the activities drawing upon members' time and energy. Just to mention a few items: The club has sponsored honey queens on the state level, has sponsored beekeeping floats in Summer parades, and has gone out of its way to encourage and help prospective new beekeepers. Monthly meetings follow a normal course of seasonal activity with the bees, with plenty of outside speakers and slide programs to keep the interest strong.

A really big item for new beekeepers is what to do with an extracted honey crop. We've all been to yard sales, roadside stands and farm markets in the Summer and we've seen some curious honey selling methods. One I remember was at an "organic" market of fresh vegetables: This one beekeeper had raided his wife's used jar collection and filled a bunch of quarts. You had to ask what was in the jars, as they were not labeled; then you had to ask what he wanted for a quart. "Oh, I dunno . . . why don't you give me a couple of dollars." Every customer was treated the same way, and I

think he had decided ahead of time how much he wanted to charge, and this was just his "folksy" way of marketing a "home-grown" product. Actually, it made me kind of irritated because my stand was near his, and my jars were store-bought and equipped with proper labels, all an extra cost that I was unable to recover because the customers all wanted his honey, which was cheaper in those darned used jars!

One of our club activities is the major fund-raiser for us each year – our booth at the local county fair. For forty-some years the club has sold honey sundaes from the booth. In more recent years we have also sold honey and other bee products (wax, pollen, comb honey, Honey Stix and candles). The honey sales are particularly important because many club members participate by bringing in their own honey to sell, but it must all measure up to uniform standards. The honey must be in new containers and have the correct labeling, and it must be clean and liquefied, except for the creamed honey containers. This all forms a good education for those with honey to sell, and they soon learn how to strain, bottle, label, and market their products in such a way that they are in compliance with the proper food requirements. As a group, we discuss ahead of time what we will charge for the bee products, and agree commonly on prices for 12-ounce bears, one-pound jars, two-pound containers, etc. Members don't try to undercut each other, but work for the well-being of the bee industry and a profit for all. So, you can see how our bee club uses the medium of a local fair to mentor the marketing of our honey with the high standards and the kind of publicity that keeps people coming back to the bee booth year after year for some more of that good, natural, local honey.

An additional advantage of our bee club has been in the area of queen stock. When I was a kid, back in the 1950s, the club chairman, a Mr. Mattson from east of Brainerd, always ran a queen bank for the members in the Spring. Of course, in those days we didn't have to worry about *Varroa* or tracheal mites, and didn't know anything about nosema, so queen banks were much simpler than they are today (Apistan, queen tabs and fumigillin were unknown). It was always a comfort to know that if you installed a package and lost the queen, you could call Mr. Mattson and he probably would have a replacement queen on hand which he would sell you at his cost. Therefore, you wouldn't have to wait on the mail service for a week or two until a southern breeder could ship you a replacement queen.

As part of our club project, we decided to raise some queens out of the more successful colonies in the club apiary. After going through the first season and keeping pretty good production records on each colony and on each of the five breeds we had in the yard, we put the bees through the nasty Winter of 1995-'96, and the survivors of that final test of endurance were the ones we could graft from to raise cells for our membership. We grafted larvae, demonstrated how to set up and maintain cell-raising colonies, showed how to split or divide strong hives in the early Summer, and gave members the training on proper handling and installation of queen cells and the opportunity to try it themselves. If you have a bee club in your area, do you help your members with their queen problems in this way? Queen banks are not hard to maintain, but queen rearing can be very complicated, though not insurmountable. It leaves me a bit uneasy to see some of the bee supply outfits marketing queen-rearing kits with incomplete and inadequate directions. Our club pointed out some of these shortcomings in our queen project, and it again is probably best for all concerned to see with their own eyes how to do the job so that they are not deluded into thinking it is all simpler than it is. As a club project, some found the queen-raising program to be the most interesting and informative of the new things we tried in this area of the country.

The value of raising queens in this way was further increased by making the extra cells we produced available for the members' own divides. Armed with the know-how of handling the new cells, all of them soon found new homes. A couple of the beekeepers even brought their own splits to the club apiary site to see that the job was done right by the "experts." In addition, the bee-

. . . and then how to install them. (Rose Zak photo)

keepers would have a second place several miles away from home apiaries on which to place their splits. Of course, we had no control over what the queens would mate with, and would have to take our chances with whatever drone stock was in the area. Still, it probably was an improvement over just letting the bees raise their own emergency replacement queens, with the loss of critical time in development and no control at all over stock quality.

One important characteristic that apparently did not survive the queen project was tracheal mite resistance. Now, don't get me wrong – when we originally ordered the five breeds, three of them were touted to have mite resistance – we had no real idea as to the veracity of the claims of bee breeders or of the trueness of their own mated stock. Just because someone says that his queens are mite resistant doesn't mean that they really are. Microscopic examinations eventually revealed plenty of mites as we started losing whole colonies in the Winter and got around to sampling the sick and dying bees. We finally were forced to find out what was wrong. We should have suspected mite problems in the Summer of the first year as some hives made hardly any honey and did not build up very well. In only one breed were tracheal mites never found, thanks to Brother Adam, though several strains ap-

Continued on Next Page

Our fair booth earns money, sells honey, and promotes beekeeping. (Don Jackson photo)

BEE CLUB ... Cont. From Pg. 41

peared to have no mite damage in the first year. As a group, we learned that seemingly mite-free colonies probably do have tracheal mites, or should be suspected to have them, even if they perform well in the year of purchase. The mite infestation developed insidiously during the Winter months, their damage being revealed to us too late for us to do anything about it: You cannot feed menthol in cold weather because it won't vaporize and kill the mites, and extender patties do not have a chance to be effective at all when the insects are clustered tightly and not moving in the bitter cold.

A final benefit of our club work was a group order of package bees. Having started with five breeds and finding out that one in particular far outstripped the others in most respects, we were able to conclude that a group order could help all who wanted bees in the Spring. Just think about it for a minute. . . . How many of us order bees by simply picking up an ad in a bee magazine and calling the phone number, not having any idea how those bees will perform? If you are just starting out with bees, or even if you are experienced, this can only be confusing, for the ads make so many claims. "Bred from top honey-producing hives," "Bringing you Nature's Best Queens," "Selected for disease resistance, gentleness and honey production," "Clean housekeepers, good honey producers," "Quality Queens," "Mite Resistant Stock," "Reliable Italian Bees," "We don't want to be the biggest – just the BEST," "Top Quality," "Distinguished by our Quality & Service," ". . . half their ovaries tied behind their backs – JUST TO MAKE IT FAIR!" are a few of the ads from just one bee magazine.

Our bee club circumvented all the claims by bee suppliers by ignoring the ads, following up on our experience instead. We made our group order from the company whose stock did the best for us in our area. There was no need for any silly bragging or claims of superiority – we had our own set of facts: One strain just plain did better than all the others. When we approached the supplier with the information, he was able to put together an order for us as a group that was a real price advantage to everyone. Furthermore, the group order was large enough so that we did not have to depend on the mail service to deliver the packages (we'd all heard real horror stories about dead bees arriving by mail). They were personally brought to Minnesota by a beekeeper, and the telephone gave us a precise departure and an exact arrival time so that we could coordinate a central pick-up site for all near Brainerd. All packages arrived alive, and they were good. Extra queens were sent along to replace any problem ones. There was even a follow-up shipment of additional queens 10 days later to replace any that might be giving problems. How can you beat that? I hope that this kind of service and care and concern will be a message that gets around to the rest of the supplier industry!

Beekeeping is expensive, as we all know only too well. Equipment and insect costs alone are pricey enough, and added to that are the cost of medications and the risks both in obtaining a honey crop and in surviving the Winters. Our club's demonstration yard of bees never made our organization any profit. Starting from packages, one might think that profits are no longer possible from packages, but then, we hit two difficult years in a row. On the other hand, the packages purchased this past Spring built up well and rapidly, and the year was a good one, making a fair profit for many of us. By working together as a club, we were able to buy good bees at fair prices, making profits possible. It also showed us that it pays to be in this business for more than a year or two because the good years will come just as surely as the difficult or non-productive ones come and go.

Now that the club apiary project has ended, our area seems to be having a resurgence in beekeeping. There is some disappointment by new people because we no longer have a club apiary from which they can learn all the stuff they need to know to keep bees. I guess that is a good result because it shows that the club project was really valuable for some people and perhaps could be so again at some future date. It shows that the hands-on approach is still a million dollars more valuable than reading a book or seeing a movie on beekeeping. The sense of co-ownership in the club apiary was healthy. There is so much to absorb just to get started in this expensive business, and manipulation of bees in all seasons of the year has been invaluable. Besides, what beekeep-

ers like best is to work their bees; and this gives everyone an excuse to do so, with expert guidance and experience at hand each step of the way.

As a final note about mentoring beekeeping and helping each other, the club voted at the October meeting to give a hand to young, would-be beekeepers. The group decided that if a young person was in 4-H and had a member of the bee club as a sponsor/mentor, the club would give him a free year's membership (which pays for the monthly newsletter he is sent). The club will also encourage him to start with two colonies of bees, donating one package free in the Spring, as well as help him find functional used equipment. The mentoring will help him with hands-on experience, rather than detailed, confusing, bookish reading on all the finer points of keeping bees. Now, that takes the financial bite as well as the cerebral fright out of getting started right with bees! All the young 4-Her has left to worry about is what's at the tail-end of the bee! BC

Don Jackson keeps bees and is involved in his local bee club in Pequot Lakes, Minnesota.

INNER ... Cont. From Pg. 6

the medical field suggest that a kit contain the following items, so that if an accident occurs you can treat it immediately. Get one (or more) and make sure they contain the following: A well-labeled dustproof container; current first-aid book; poison first-aid procedures, including syrup of ipecac; wound dressings, 2 inches by 2 inches and 4 inches by 4 inches (have at least a dozen of each); individually wrapped adhesive dressings (another dozen); 2-inch gauze bandage roll (have two); 1-inch roll of adhesive tape; triangle bandage for a sling; scissors; blanket; tweezers; tongue depressors; safety pins; razor blades; two instant ice packs; snake-bite kit; disposable rubber gloves; soap or antiseptic for cleaning wounds; sterile saline solution – at least an 8-ounce bottle; emergency phone numbers (hospital, police, sheriff, home, work) and directions to HQ; a 1-gallon jug of water; a sting kit. And while you're at it, make up a map of your outyards that stays at work, or home. Have on it the phone numbers of people who live close to each yard so they can be called if necessary. And, make sure you can tell the sheriff ***exactly*** where that yard is.

Protect yourself.

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It's not often you get to witness real history, the kind that makes headlines in newspapers, magazines and even books. The kind that in 50 or 100 years people will still remember, still talk about, still consider important.

Maybe I'm stretching this a bit, but not by much. In beekeeping I can only compare - Langstrogh and his frame, the first extractor, smoker, hive tool or plastic frame; the National and the North American Associations combining at the turn of the century; the first voluntary promotional Board in Madison, WI; the first honey bear; African honey bees, tracheal mites, varroa mites; the split that formed the American Honey Producers; and the formation of the National Honey Board.

Right at the beginning of February this year, finally, the American Beekeeping Federation, the American Honey Producers and the National Honey Packers and Dealers Association, settled on a way to reorganize the National Honey Board. Their agreement accommodates both beekeeping research, a quality assurance program and expanding the best of what the Honey Board already does.

We've discussed what these changes will encompass, generally, and what progress they represent. We've also presented opposing opinions, and some outright critical positions to the changes suggested.

There have been severe, uninformed and some outright wrong ideas expressed in a variety of publications during the past few months. Most of them have been based more on emotion than fact, but hard-earned, worked-hard emotions. We have here pushed equally hard to make sure what you read was at least based on factual information. Nevertheless, these several factions have come together to make what I consider a better place to be possible.

The basics of this agreement are as follows:

1. an additional assessment of 1-cent per pound of honey levied at the handler level, with the additional assessment on imported honey to be collected by U.S. Customs;
2. the allocation of a minimum of 8 percent of the National Honey Board revenues for honey bee and beekeeping research;
3. a rebate credit for qualified advertising to be available to any producer, handler, or importer, with these provisions:
   a. that reimbursements be limited to 50% of that producer's, packer's or importer's qualified advertising expenditures;
   b. that reimbursement be limited to 25% of that producer's, packer's or importer's assessments;
   c. that rebate credits may be transferred to a honey marketing cooperative or to a honey handler or to an organization established to advertise honey locally, regionally or nationally, provided that the rebate credits generated by domestically-produced honey be used only for advertising that promotes domestic honey; and
   d. that any unused domestic producer credits will be allocated by the National Honey board to domestic promotion of U.S. honey.

This agreement signed by Dave Hackenburg (new) President of the ABF, Richard Adee (new) President of the AHPA and Nick Sargeantson, President of the NHPDA, sets a precedent of significance.

There are some who still strongly feel that the producers have been given a raw deal here, that they'll just pay and pay and pay, and that the packers have it all in their favor. I don't think so. But (he adds carefully) *I'm* not paying that extra cent (whether producer, producer/packer or packer), and this is easy for me to say. Well, yes. You're right.

But, I'll tell you something. When I look at the big picture, when I talk to producers, packers, and importers, plus a great many others in some level of this vertical marketing industry, I hear that this is a good deal. Not the best deal, but a good deal.

Go back and reread that proposal. It's not bad. There's money for beekeeping research, for a quality assurance program, more promotion money, and producer representation on the board equal to what's produced in the U.S. We import a great big bunch of honey, from a variety of places, and there is good argument for offering that segment a voice in how their money is spent. And, the quality assurance part of this deal will ensure that what comes in is at least as clean and pure as what's produced here. Nobody wants to help pay promotional dollars for some of the garbage we've seen come in, in green, brown and other barrels.

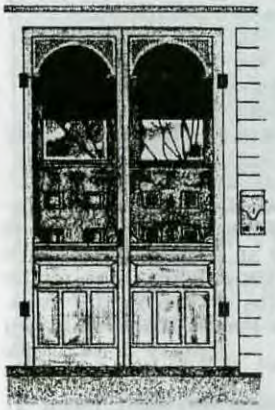
I've seen what the board and their staff can do, and I'm convinced that money in is not only well spent, but well invested. There are too many precedents in favor of that argument. But even still, some will forever disagree. But, I'm not going to accept this without some examples. I'll gaher some of these for next time!

What's next, now that there is some consensus, some unity among the players? Next comes the vote, to see if we even want to vote on this.

If I have any hesitation, it is in how well those who are in charge of oversight do this time. They have an abysmal record of competence, in my opinion, (considering how much they charge) and need their hands held. Who, I wonder, in the words of Richard Taylor, regulates the regulators?

We'll wait, and see, and watch. And be better off if it all works out.

Kim Flottum



Ann Harman

Home Harmony

Peanuts, Sauces, and Borrowed Books!

We celebrate all sorts of holidays: Fourth of July, Easter, Thanksgiving. But there are other celebrations throughout the year that many of us don't know anything about. Perhaps if these special days or months were found on ordinary calendars, we would have cause to celebrate those occasions. Each month's calendar is filled with special days and weeks. Even the entire month is reserved for numerous special topics to be honored.

March is no exception. You could join a celebration of teddy bears during the first weekend in March or perhaps join in festivities for Music in Our Schools Month. Honey cookery has nothing to do with those or some other events. However, honey's place in cookery can be part of National Nutrition Month, National Peanut Month and National Sauce Month. All of these are celebrated in March. Now those are indeed something honey cooks can participate in.

Peanuts are a nutritious food, being high in niacin and other B vitamins, especially if the peanut heart is left in the various peanut products. Unfortunately, sometimes the hearts are removed and used for wild bird food. Here they make a valuable addition to the diet of wild birds. With the popularity of wild bird feeding, certainly those peanut hearts must be a part of the celebration of National Nutrition Month.

Everyone can find a recipe for peanut butter cookies made with honey. I think every honey cookbook has a recipe for those. This month we'll look at other ways to use peanuts and peanut butter, along with some recipes for sauces.

PEANUT BUTTER-HONEY ICE CREAM TOPPING

To start out our celebration we'll have a sauce recipe using peanut butter. This combination is really good. Use it on some vanilla honey ice cream.

1/2 cup honey
1 tablespoon cocoa
2 tablespoons peanut butter
1 teaspoon vanilla

Place honey and cocoa in saucepan over low heat. Stir until blended. DO NOT BOIL. Remove from heat and stir in peanut butter and vanilla. Pour warm sauce over ice cream.

Ontario Honey Recipe Book
Ontario Beekeepers Association

APPLE PEANUT SALAD WITH SOUTHERN DRESSING

Here is a recipe that uses both peanuts and peanut butter. The dressing can certainly be used in other fruit salads.

3 apples, unpeeled, diced
1 cup celery, sliced
1/2 cup peanuts, chopped
salad greens

Southern Dressing:
1/2 cup orange juice
1/2 cup pineapple/grapefruit juice
1/2 cup peanut butter
1/2 teaspoon salt
3 tablespoons honey

Combine apples, celery and peanuts; set aside. Add fruit juices slowly to peanut butter, blending until smooth. Add salt and honey, stirring until dissolved. Toss apple mixture with Southern Dressing and serve on crisp salad greens. Serves 8.

Honey Recipes
North Carolina Beekeepers Assn.

PEANUT BUTTER SURPRISE PIE

This next recipe is really something special, even if you are not a peanut butter lover. A clover or wildflower honey would be appropriate for this.

1 9-inch baked pie crust
2-1/2 cups milk
1/4 cup warmed honey (1)
1/4 cup cornstarch
4 egg yolks, beaten
2 tablespoons butter
1 teaspoon vanilla
3/4 cup peanut butter
1/4 cup warmed honey (2)
4 egg whites
2 teaspoons warmed honey (3)

In a saucepan, combine milk, 1/4 cup warmed honey(1), and cornstarch. Bring to a boil over low heat, stirring constantly. Pour a little of the hot mixture over egg yolks, then return to the milk mixture in the saucepan and cook slowly until thick, continuing to stir. Remove from heat and add butter and vanilla. Combine peanut butter and 1/4 cup warmed honey(2) and spread over the bottom of baked pie shell. Beat egg whites until frothy, then slowly add 2 teaspoons warmed honey(3), a few drops at a time, and beat until stiff, smooth and shiny. Pour custard over peanut butter mixture in pie shell. Cover with meringue and bake in 350°F oven about 10 minutes until lightly browned. Chill thoroughly before serving.

Naturally Delicious Desserts And Snacks
Faye Martin

PEANUT BUTTER FRENCH TOAST

Peanut butter and honey sandwiches are quite popular. Sandwich lovers need to try this next recipe.

It's really wonderful. Two methods of cooking the sandwiches are given; both work equally well.

1/2 cup peanut butter
1/4 cup honey
1/4 teaspoon salt
8 slices bread
2 eggs, beaten
1/2 cup milk
2 tablespoons butter or margarine

Blend peanut butter, honey and salt. Make a sandwich by spreading about 2-1/2 tablespoons of the peanut butter-honey mixture between 2 slices of bread. Combine egg and milk. Soak sandwiches in egg mixture. Melt butter or margarine in a baking pan or fry pan. Bake sandwiches at 400°F for about 40 minutes. Turn sandwiches to brown both sides. Or cook slowly in fry pan on top of range. Four servings.

Peanut And Peanut Butter Recipes
USDA Bulletin

BRANDIED SAUCE WITH RAISINS

Those peanut recipes should be enough to celebrate this month. Now for some sauces so you can join in the National Sauce Month festivities.

Try this with quail or pheasant.

1/2 pound white raisins
2 cups water
3 ounces apricot brandy
1/4 cup honey (use a light and mild variety so as not to mask the full flavor of the sauce)

Cook the raisins in water for 1/2 hour over low heat. Add the apricot brandy and
honey and simmer 1/2 hour more. Cool before serving. Makes 2 cups.

A Honey Cook Book
The A. I. Root Company

ALL-AMERICAN BARBEQUE BASTING SAUCE

This next sauce recipe would really make a grand finale to this month's celebrations. It is quickly made, in spite of the long list of ingredients. Try it.

3 teaspoons chili powder
3 teaspoons black pepper
3 teaspoons dry mustard
3 teaspoons paprika
9 tablespoons honey
6 teaspoons salt
4-1/2 cups beer
1-1/2 cups vinegar
12 tablespoons bacon drippings
3 tablespoons Worcestershire sauce
3 tablespoons hot red pepper sauce
4-1/2 tablespoons lemon juice
4-1/2 tablespoons grated onions
6 cloves garlic or 6 teaspoons garlic powder

Combine ingredients. Simmer 20 minutes over low heat. Refrigerate up to 6 months, using as needed. This sauce is delicious with chicken. The recipe will baste 5 slabs of ribs. Yield 7 cups.

The Healthy Taste Of Honey
Larry J. M. Lonik

By the way, the first week in March is Return the Borrowed Books Week. Did you participate in that?

Richard Taylor

Bee Talk

"To control AFB, first have strong colonies. This is the first rule of good beekeeping quite apart from any considerations of vulnerability to disease."

This might be a good time to say something about American foulbrood. So much attention has been given during the past few years to parasitic mites that foulbrood has sort of slipped into the background, but of course it is still with us, and it is still a serious problem. The reason I want to talk about it now is that I find a great deal of misunderstanding about this disease and how it is spread.

Beginning beekeepers, and some who are not beginners, tend to imagine that if some American foulbrood (AFB) spores get into a hive, then that colony is going to get the disease. Cause and effect, simple as that. Bee inspectors have sometimes encouraged this idea. If they find a single cell with a diseased larva, then they suppose that the colony is doomed and must be burned before the spores get into other colonies. I once asked a bee inspector from another state what he did when he found a mild case of AFB, and he responded that there is no such thing as a mild case. Beekeepers, therefore, tend to assume that they must, at all cost, prevent AFB spores from getting into their hives and equipment.

I once thought that way. Back in the '50s, when I bought a used extractor, I took it to a commercial laundry and paid someone there to steam it out. I didn't think that merely washing it thoroughly with hot water would be enough, and I didn't want any foulbrood spores going into my honey house.

Without minimizing the seriousness of this disease, let us get before us a better understanding of just what it is and how it is transmitted.

American foulbrood – so-called because it was first identified by an American – is caused by a bacterium (*Bacillus larvae*), not by a virus or fungus. What makes it especially pernicious is that it has a spore stage, and these inactive spores can remain viable for years and years. Old equipment – supers, frames, whatever – that are heavily contaminated with these spores can, if given to a healthy colony, transmit the disease, this being, in fact, quite common. Such equipment can be quite easily sterilized, by scorching supers on the inside, for example, or dipping frames in hot lye solution.

For a colony to come down with AFB, however, vast numbers of spores must be present, and in addition, they must get into the gut of very young larvae, or in other words, they must get fed to the brood by the nurse bees. The mere presence of spores in a colony will not normally cause an outbreak. Sugar water, deliberately contaminated with AFB spores, has been fed to colonies without any resultant disease.

What is more important to realize is that a strong – repeat, *strong* – colony of bees can, and normally will, rid itself of this infection in its early stages. The bees do this by cleaning out diseased larvae. But if the colony is weak, then the disease gets the upper hand and, as the population begins to dwindle from lack of replacement by emerging brood, the disease spreads rapidly through it and the colony is soon dead.

The first requirement, then, is to have strong colonies. A few years ago I was talking with Dr. Warren Parsons out in Michigan, and he told me about his studies with the great American beekeeper and teacher, Dr. John Eckert. Eckert relied *solely* on having strong colonies for the control of AFB. If he came upon a colony with AFB he simply combined that colony with the strongest colonies in his apiary and let the bees clean up the disease. His solution to the problem of American foulbrood was summed up in two words: good housekeeping. Nor is he the only one to have used this approach. I have been told, by more than one source, of a large commercial beekeeper in Canada who used the same method. If he found a diseased colony he simply dismantled it and distributed it among his strongest colonies, letting the bees clean out the diseased larvae.

The reason this method of control is not more widely advocated is that there is a fear, and a justified one, that inexperienced beekeepers might do more harm than good by trying it. Such a beekeeper is apt not to realize that his bees are infected with AFB until the colony is very heavily infected, and there would thus be the possibility that a strong colony, instead of cleaning it up, would itself succumb. Bee inspectors, accordingly, want to see diseased colonies completely destroyed by burning them.

Of course that method of dealing with AFB can be badly overdone. I once asked a bee inspector what

he would do with the supers – for example, several circular section supers, more or less filled with honey – that might be on a colony in which one or two diseased cells had been found. His reply was that it wouldn't make sense to burn the colony and leave some spores up in the supers. In other words, he would burn up everything, supers and all!

And that is sheer foolishness. Honey stored in comb honey supers is not going to get fed to larvae, and thus poses no threat. I have removed such supers, only partly finished, from colonies known to have AFB, given them to healthy colonies, and never transmitted the disease as a result.

Nor is it necessary to destroy the bees even of a fairly heavily infected colony, for AFB is a disease of the larvae, not of the adult bees. Thus the bees of a diseased colony can be shaken in front of a hive fitted with foundation only – no brood, no drawn combs – then built up by feeding the colony sugar syrup, and they will be free of the disease.

American foulbrood, it should be noted, tends to persist in certain areas while other areas, sometimes not far from these, seldom have it at all. No one knows for sure why this is so. In those areas where it persists, no efforts at eradication, no matter how thorough, ever entirely succeed. This was the conclusion of the late Frank Pellett after his many years of service as the Iowa state apiarist. He ventured no explanation.

What practical conclusions concerning management can we derive from all this? I suggest the following:

First, have strong colonies. This is the first rule of good beekeeping quite apart from any considerations of vulnerability to disease. If you have a weak colony, and it has not been weakened by an already advanced case of AFB, then combine it with one or more other colonies.

Second, dust the top bars of your brood chambers with terra mix every Spring, before any honey supers go on. Do this two or three times, at intervals of a week or so. (Follow label recommendations as to amount, frequency and timing.)

Those two steps, by themselves, will usually keep an apiary free of AFB.

If you find AFB in a colony then, in my opinion, you should burn it. If it is weak, then destroy the bees too, as they are not worth saving. You need not burn the supers if they contain only honey. Hive bodies, covers and bottomboards can be saved and scorched out on the inside.

And how do you know whether a colony has AFB and not some other disease, such as European foulbrood? The first symptom to notice is a bad smell in the combs. But the real test is to probe the dead larvae with a match or toothpick or something similar. If the remains of the larva clings, gluelike, to the probe when you withdraw it, stringing out like a piece of string for an inch or so, then you're looking at AFB. And AFB is the *only* bee disease that justifies burning. Even then, in my opinion, burning is not justified if the infection is very slight and the colony is still strong or can be made strong by uniting it with another colony. BC

Richard Taylor is a philosopher and lifelong beekeeper who lives in the Finger Lakes region of New York.

?Do You Know? Answers

1. **False** For high quality queens, the grafted larvae should be less than 24 hours old, preferably as young as 12-18 hours of age.
2. **True** In common with the worker bee, the queen develops from a fertilized egg. Fertilized eggs which produce female offspring are laid in either worker or queen cells. All female larvae develop into queens or workers, depending on the food and care given them during the early stages of their larval life.
3. **True** Starter hives or swarm boxes that receive newly grafted queen cells may be either open units allowing free flight or closed units.
4. **True** The construction and number of queen cups found in a colony, especially in the spring is a good index of colony condition, and the first sign visible to the beekeeper that a colony is beginning to be crowded and might swarm in several weeks. The greater the number of cups, the greater the amount of congestion or crowding.
5. **True** Great care should be taken to prevent the young larvae from becoming chilled or overheated, or from drying out during the grafting process. The bars of grafted cups and combs from which the larvae are grafted from are often wrapped in moist towels to keep them from becoming desiccated.
6. **False** Queen rearing in preparation for swarming begins when eggs are laid or placed in queen cups. Most of the eggs in queen cups are laid by the queen, but workers can and do move a small number of fertilized eggs or very young larvae from worker cells into queen cups.
7. **False** Virgin queens do not become sexually mature until the fifth or sixth day after emergence.
8. **True** Pheromones produced by the queen inhibit ovary development in worker honey bees and prevents them from laying eggs. Queen cells will also inhibit the growth of worker bee ovaries just as a live queen will and is believed to be associated with pheromones produced by developing queens.
9. **True** Soon after a queen cell is capped until approximately 24 hours before the virgin queen emerges, queen cells should not be handled or disturbed. Queen cells placed on their sides during the pupal stage may die or the virgin queen may emerge with deformed legs or wings.
10. By confining the queen to one comb each day, there is a large quantity of similar aged larvae ready for grafting three days later.
11. Royal Jelly
12. Aid in the removal of the young larva from the grafting needle. Prevent the drying out of the young larva before being returned to the care of bees in the starter colony.
13. Overabundance of young nurse bees
    Queenless
    Abundant supplies of nectar and pollen
14. Beeswax
    Plastic
15. Under emergency conditions, queens are usually reared from already developing larvae in comparison to the swarming and supersedure impulse where the queens are usually reared in prepared cells in which the queen lays an egg.
16. Queens produced in preparation for swarming or supersedure of the old queen are normally higher in quality than queens produced in emergency queen cells. Quality differences are related to the selection of older larvae and consumption of less royal jelly in the emergency situation.
17. Double grafting is a technique in which the larvae grafted into queen cups are discarded after 24 hours and replaced with new larvae of grafting age. It is believed that the second larva will be better fed due to the royal jelly that is already present in the cup and a larger, better queen will develop.
18. Primary swarms are normally accompanied by the old queen of the parent colony from which the swarm issued. Therefore, it would be wise to replace her soon after the colony is established.

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

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

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

Questions?

TM - 25 or 10?

I ordered a packet of TM-25, and when it came it said "This packet contains 10 grams of oxytetracycline." So it looks like I got TM-10 instead of TM-25. I checked my reference books, and one said that 2½ units of TM-10 are equal to one unit of TM-25. Does that mean that I have to mix two and a half packets of what I bought to get the equivalent of one packet of TM-25? Another reference book explains that TM-25 contains 25 grams of active material per pound, and that doesn't help much either. I am confused. Can you help me?

Robert L. Graham
Dittmer, MO

The manufacturer of this product appears to have had as his chief aim to confuse the purchaser, mixing grams and pounds, and nowhere stating whether the packet is TM-25, TM-10 or what. Here's how to unravel this mystery: If your packet says 10 grams per packet, and the packet contains 6.4 oz., then multiply 6.4 times 2.5 and you will get 16 oz., or one pound – so you see, there are, after all, 25 grams of active ingredient per pound. So, notwithstanding appearances, it turns out to be TM-25 after all! Now what I do is, I mix one such packet with two pounds of powdered (confectioner's) sugar and scatter maybe a tablespoon or so (depending on how strong the colony is) over the top bars of the brood nest, in the Spring, when brood rearing is going on. The terra has to get into the *larvae* to do any good. Then repeat this about 4-5 days later and, do it again about 4-5 days after that. Also, make sure you get soluble terra. The terra sold for pigs is mixed with rice hulls or something, and the bees will not touch it.

Nuc Dimensions?

What are the internal dimensions of a three-frame nuc?

Mitchell Drinnon
Sneedville, TN

The internal width should be about 4¾", just wide enough for the three frames with a little to spare at the sides, for easy frame removal. Internal length is, of course, the same as a standard super.

Fast Build-Up

I want to build my colonies up rapidly this Spring. Can I combine pollen substitute, sugar, terramycin and vegetable shortening? What is a good ratio for mixing them? I plan also to have sugar syrup jars on the hives at the same time.

Adin Ramer
Wakarusa, IN

Yes, these can all be combined. A ratio I have used is 1 lb. vegetable shortening, 2 lbs. granulated sugar and 6 tablespoons of TM-25. To this you can mix as much or little pollen substitute as you wish. For a larger quantity you can mix a pack of TM-25, 5 lbs. shortening, and 9 lbs. sugar. A still easier mix is to just add vegetable oil, rather than shortening, to granulated sugar, a little at a time, until you get the right consistency, let it set overnight, then add more oil or sugar, as needed, the next day; then add TM-25 and/or pollen substitute in about the proportions given above. Warning: If you feed sugar syrup, in addition to all this, you may get a lot of early swarming, thus defeating your purpose.

Cleaning With Lye

What is the hot lye recipe for cleaning old frames? Can combs infected with AFB be melted down and the wax used for foundation? And do you think Africanized bees will change beekeeping as we know it today?

F. B. Barrett
Gaston, IN

The way to mix lye with water to clean old frames is to get a large vessel over a burner, preferably outside or in a garage (not in your kitchen), put water in it, light the burner, then add lye *slowly* as the water heats up. Add about one pound of lye to 10 gallons of water. Save the frames with the most wax on them until last. Stack the dipped frames outside and hose them down when finished. Wear goggles all the time you are doing this. One drop of lye water in you eye can blind it. Yes, infected combs can be melted down and the wax is perfectly safe. As for Africanized bees, they will certainly change beekeeping in the Gulf states, and perhaps much of the rest of the south, but I am quite sure they will never invade the northern states, for many reasons.

Purple Martin House?

I want to erect a house for purple martins but I don't know anything about it. Where can I get information?

Conrad Nelson
Eau Claire, WI

This question keeps coming up in these pages, so there seems to be a widespread interest in attracting these birds. They have very special requirements for nesting sites which are, however, usually easy to meet, and essential to know. For information write to the Purple Martin Conservation Association, Edinboro University, Pennsylvania 16444.

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

Answers!

Richard Taylor

Gleanings

MARCH, 1998 • ALL THE NEWS THAT FITS

Russian Bees Ready, and Local Bees, Too

BATON ROUGE BEE LAB STAYS INVOLVED

Russian honey bees that may be able to resist bee-killing mites have passed quarantine inspection at Grand Terre Island in Louisiana near the mouth of the Mississippi River.

This will allow scientists with the Agricultural Research Service to begin outdoor experiments to determine if the Russian bees could become allies of domestic honey bees under attack from varroa and tracheal mites.

If the mild-mannered Russian bees prove mite resistant, scientists could distribute hybrid bees--offspring of Russian queens and American drones--to beekeepers. The beekeepers could use the hybrids to breed new colonies of resistant bees and thus put the mites out of business. Naturally resistant honey bees would be an environmentally friendly alternative to chemical insecticides.

USDA's Animal Health and Plant Inspection Service lifted a 7-month-long quarantine on Feb. 5. APHIS inspectors reviewed ARS' evidence showing the Russian bees carry no foreign pests or diseases and are safe for U.S. citizens and ecosystems.

ARS' exhaustive screening of the bees began shortly after their July 1, 1997 arrival at New Orleans International Airport. The scientists immediately transported the bees to the quarantine facility on Grand Terre Island.

In experiments beginning this spring, scientists will test the bees not only for mite resistance but also for honey production and other traits beekeepers value.

The Russian honey bees evolved in the mite-infested region of Primorski in Russia's Far East. Researchers suspect that the constant mite challenge over time led to nature favoring only the most resistant bees.

The USDA, ARS Honey Bee Breeding, Genetics and Physiology Laboratory in Baton Rouge, Louisiana is continuing to evaluate U.S. honey bee germplasm for traits which contribute to resistance to, or tolerance of, *Varroa jacobsoni*. Beekeepers are urged to contact us if they know of infested colonies that have survived for more than year without acaricide treatment.

For the past two years, queens from "survivor" colonies were provided by beekeepers from around the country. Each year, about 25 colonies were established with uniform bee and mite populations in tests in which we measured the population growth of *Varroa* and studied factors that potentially influence this population grrowth. In most cases, mite populations grew very rapidly during the three-month tests – *Varroa* populations increased by an average of 500% in 1996 and by 700% in 1997. But responses among the test colonies were variable, and the best performing colony had only a 36% increase in mite growth. Each year, we have been conserving

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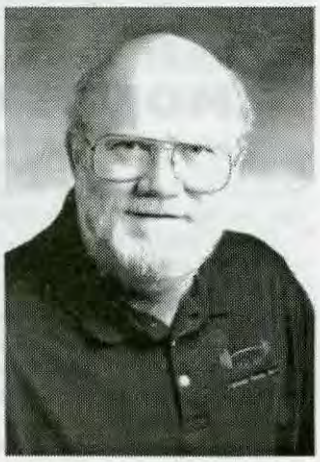
Dutch Gold Award

FORE WINS BEAR!



On January 16th, at the American Beekeeping Federation's Annual Meeting in Colorado Springs, Colorado, the recipient of the 1998 Dutch Gold Honey Bear was announced. This award is given annually to an individual in the beekeeping industry that has made a long-standing personal contribution to the industry. This year's recipient is Troy H. Fore Jr. of Jesup, Georgia.

Troy grew up in a beekeeping family in Wayne County, Georgia. After he graduated from high school in 1963, he went in to partnership with his father, Troy Sr., in the family beekeeping operation. In July of 1969, Troy founded Fore's Honey Farms which was involved in honey production, honey packaging, bee breeding and pollination services for over 18 years.

In 1972, Troy and his wife, Mary, began to publish *The Speedy Bee*, a national trade journal, for the beekeeping and honey industries. Prior to publishing *The Speedy Bee*, he was

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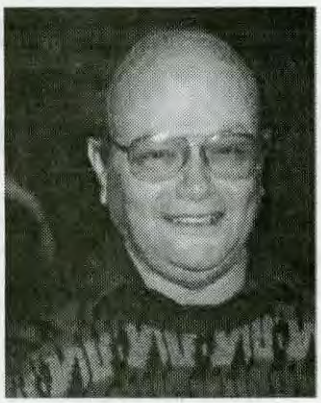
SANFORD WINS AAPA



Dr. Tom Sanford, University of Florida Extension Apiculturist received the American Association of Professional apiculturists "Award for Apiculture Excellence." Each year the AAPA recognizes one of its active or emeritus members to receive this national honor. Selection of the recipient for the award is based on the quality of his or her contributions to the field of apiculture.

Dr. Sanford is recognized as having made significant contributions to the field of apicultural extension. He has a very strong record of acting as a liaison between the research community and others who benefit from receiving information about honey bees and other pollinators. He, "more than anyone else, has brought the information age to American apiculture. His monthly newsletter *Apis* has grown from a Florida clientele newsletter to a worldwide clearinghouse for news and ideas. Dr. Sanford is gifted at

Continued on Next Page

Asia Demand May Weaken, But . . .

AG EXPORTS TOP $58 BILLION

Agriculture Sec. Dan Glickman announced (Dec. 2) that the fiscal 1998 forecast for U.S. agricultural exports continues firm at $58.5 billion. This would be $1.1 billion above the fiscal 1997 level, and the second highest export total on record. Glickman said, "Exports are critical to the economic success of U.S. agriculture. With American farmers' continuing reliance on international markets, this forecast is good news for America's family farmers and also for the many businesses and their employees in other sectors who depend on agricultural exports for their livelihood." A solid showing is expected in the export value of soybeans and products, poultry and products and horticultural products. Glickman said, "A concern is the potential for a slowdown in exports to Southeast Asia and South Korea due to the financial crisis. However, Southeast Asia accounted for only 5% of U.S. agricultural exports in 1997, while South Korea accounted for 6%. The financial crisis is slowing income growth, and that may weaken demand for U.S. exports. But agricultural products, particularly bulk commodities, may be less affected than industrial or luxury goods." Fiscal 1998 U.S. agricultural imports are projected at $38 billion, $2.2 billion above the fiscal 1997 total of $35.8 billion, making the trade balance $20.5 billion.

Despite Problems (& This Year's Rain)

ALMONDS ON THE RISE

According to the Almond Board of California's "Industry Position Report" for December 1997, the CA almond crop has reached 744 million pounds, making it the largest crop on record. Four months into the 1997-1998 crop year, this figure surpasses the objective estimate of 680 million pounds.

Almond Board Chairman, Joe MacIlvaine, stated, "Following on the heels of two relatively short crops, a large crop is welcome news and the timing has never been better for the Almond Board to roll out a national campaign to promote almonds. We're on the threshold of a new era for almond growers and we need to promote almonds for almond growers."

The Almond Board will kick off a national print advertising campaign this Spring, touting the slogan, "Almonds Are In." Ads depicting the great taste and nutrition of California almonds will direct consumers to the Board's expanded Website to be unveiled this Spring.

Almond Crop Estimates vs. Actual Receipts

Crop Year	Subjective Estimate	Objective Estimate	Final
1991-1992	450	460	486
1992-1993	570	550	546
1993-1994	520	470	489
1994-1995	610	640	733
1995-1996	430	310	367
196-1997	520	530	507
1997-1998	710	680	744 to date

From Here To There

HOW DO BEES NAVIGATE?

Australian researchers are using the ability of bees to find their way between hives and nectar sources in an attempt to create a flying robot that can navigate its own course.

Australian researchers are using the ability of bees to find their way between hives and nectar sources in an attempt to create a flying robot that can navigate its own course.

With funds from the military establishment, Australian National University scientists have built an All-Weather Bee Flight Facility in Canberra to advance their research.

"We've got a grant from the defense department to put insect like vision into a flying vehicle - can we get the robot to judge distances, navigate and do smooth landings?" said Mandyam Srinivasan of the ANU's research school of biological sciences.

"We're looking at how bees encode distances in their brains, how they recognize flowers," he said.

"We can use this research for navigation in robots, such as flying machines or waterborne machines, which can't measure their distance by wheel rotations."

Srinivasan said because bee brains are so simple, they are perfect for developing robot technology.

"The bees judge how the world moves as they move - that is, close objects whiz by very fast, but objects that are further away go by more slowly," he said

The evidence of how simple insects such as bees navigate and avoid obstacles is useful in all sorts of robotics work, Srinivasan said.

"Bees are very useful because they basically have a stripped-down, simplified version of our own brains," he said. "They are one of the few things you can train - in fact, they're easier to train than some higher creatures. Bees are basically programmed to come and get their food and that's what they do."

BATON ROUGE ... Cont. From Pg. 55

the best performing colonies such as this one for further stock research and development.

We ask the nation's beekeepers to check for possible "survivor" colonies as beekeeping activities are stepped up in the weeks ahead. Our 1998 plans are to again evaluate new candidate queens and add the best to our germplasm collection. Each contributing beekeeper will be sent the results of the evaluation and a replacement queen (or queens) from the selected, propagated material.

The chief goal of this project is to deliver genes for mite resistance back to U.S. beekeepers. Thus, this is a unique opportunity for concerned beekeepers to contribute to the well-being of their industry. Anyone wishing to support this effort should contact one of the principal investigators (listed below) by mid-April. Please do not send queens before making arrangements with us.

Robert Danka (504) 767-9294, rdanka@asrr.arsusda.gov; John Harbo (504) 767-9288, jharbo@asrr.arsusda.gov; Thomas Rinderer (504) 767-9281, trindere@asrr.arsusda.gov

USDA, ARS Honey Bee Breeding, Genetics and Physiology Laboratory, 1157 Ben Hur Rd., Baton Rouge, LA 70820-5502, (504) 767-9280, FAX (504) 766-9212

HONEY BEES SEIZED AT MELBOURNE

A passenger from Japan arrived at the Quarantine examination bench and declared he had food items. While inspecting these the Quarantine Officer noted a commercially packaged jar of 'Honey Bee' that turned out to consist of honey bees marinated in soy sauce. The product was seized and will be kept for display purposes.

AQIS Bulletin, August, 1997

FORE ... Cont. From Pg. 55

involved with the *Wayne County Press,* a weekly community newspaper, first as a reporter/photographer and within seven years he advanced to Editor. Troy continues to have an interest in publishing, as president of Glynn Press, Inc., which publishes two biweekly newspapers.

Troy's association with the beekeeping and honey industry is well known. Troy has served the industry as president of the GA Beekeepers Association, as Executive Committee member of the American Beekeeping Federation and current Executive Director, member of National honey Board Nominations Committee, and member of the Agricultural Technical Advisory Committee for Trade in Sweeteners. Troy has been a key participant in many of the industry's key issues and has been pivotal in his role as Executive Director of the American Beekeeping Federation.

Dutch Gold Honey and the Gamber family congratulate Troy on his lifelong dedication to the beekeeping and honey industry.

The Dutch Gold Honey Bear is awarded in honor of Luella and Ralph Gamber, the founders of Dutch Gold Honey, Inc. The bronze honey bear on a walnut base, is a replica of the original model created by Woodrow Miller and W. Ralph Gamber in 1957. A $2,500 bee research grant in honor of Mr. Fore will be presented to the institution of his choice.

SANFORD ... Cont. From Pg. 55

pointing out the mega-trends and provocative questions of beekeeping – changing roles of Extension in light of the internet, the role of non-Apis pollinators, what makes beekeepers adopt new methodologies?, is the honey bee still a wild animal? Dr. Sanford is universally respected for his careful standards of scientific reporting and tactful diplomacy. He is a quiet leader in our field and has certainly deserved this national honor."

HONEY BOARD BRIEFS

With the public placing a greater emphasis on the health benefits of certain foods and on food safety in general, the Honey Board continues to focus on health-oriented honey research. The NHB is preparing white papers on honey's role in diabetes treatment, in wound healing and in fighting yeast infections. Work is also being done to show honey's possible use as an antibacterial agent and an antioxidant. Yet another new study, "Effect of Honey on Bifidobacteria," focuses on the effect honey has on the growth, activity and viability of Bifidobacteria, a "good" bacteria that contributes to a healthy digestive tract. "The results of this small study may provide the scientific basis for honey to be used in an emerging market," said Marcia Cardetti, technical director for the National Honey Board.

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Agriculture Secretary Dan Glickman announced (December 15) the publication of proposed regulations that would govern USDA's National Organic Program. Glickman said, "Although around for nearly 40 years, just since 1986, the market for organic food has exploded, growing over 40-fold so that by 1996, sales totaled $3.5 billion. In spite of this growth and the enormous potential this market promises, America's farmers, especially our small farmers, still have to navigate a confusing, sometimes conflicting, patchwork of some 40 state and private certification programs." By setting a uniform national standard and leveling the playing field, these new rules will open the door to this new market and offer new economic opportunities for farmers.

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Recent Retail Sales Data From Nielsen

Nielsen reported that retail honey sales were up 1.8% (pounds) and up 5.4% (dollars) for the four-week period ending October 25 (versus the equivalent period in 1996). The average price per pound for honey during this period was $2.39. For the 52-week period ending October 25, honey sales were down three percent (pounds) and up 10.8% (dollars).

The Latest Numbers From Research Dimensions

Research Dimensions' packer tracking study, based on data from 15 honey packers representing approximately 50% of all honey sold, reported that total honey sales in October were up 15.69% over October of last year. Following are changes by segment:

Export	+64.32%
Retail	+1.59%
Foodservice	+13.5%
Bulk	+33.16%

An International Trade Lead Service is available to help U.S. honey exporters identify new sales opportunities in international markets. Trade leads are collected at the National honey Board office from overseas contacts, trade journals and international trade shows. Trade lead service subscribers can receive this information immediately by fax or e-mail. Subscribers also receive other valuable information on international commerce on a regular basis. In 1996, each trade lead subscriber received 136 trade leads.

This service is available for only $60 a year. To subscribe to the trade lead service in 1998, send your check for $60 to Jami Yanoski at the National Honey Board, 390 Lashley Street, Longmont, CO 80501. Be sure to include your name, address, phone number, fax number and e-mail address. If you wish to subscribe using Visa or MasterCard, please call Jami Yanoski at (800) 553-7162.

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The Honey Board invites you to participate in the upcoming Apimondia meeting, to be held in Vancouver, Canada, September 12-17, 1999. Apimondia is the most significant and largest international beekeeping/pollination meeting held worldwide, and occurs every other year. Previous Apimondia meetings have attracted 3,000-7,000 participants and over 200 commercial exhibitors. "Our goal for 1999 is to host a highly organized and broad program to enter the new millennium that is simply the best beekeeping meeting ever held," said Dr. Mark L. Winston, professor and chair, Apimondia '99 Program Committee. Plan to be there!

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Honey is being used as an ingredient in more foods, pharmaceuticals and cosmetics than ever before. As a result, honey producers should pay close attention to microbiological specifications set by manufacturers of such products. According to a recent report in Food Processing magazine, 3M now offers a product that allows individuals to create their own in-house lab to test for microorganisms. The "3M Laboratory Start-Up Kit" contains a training video that teaches how to establish a lab and conduct microbial testing. For more information on the Laboratory Start-Up Kit, contact 3M's Carie Anderson at (612) 737-5090.

EAS RESEARCH FUNDS

The EAS Foundation for Honey Bee Research is a competitive grant program developed from donations received from beekeepers and others interested in funding research on topical problems in apiculture. Proposals are hereby solicited with awards to be announced at the 1998 Annual Meeting. Awards should be considered seed money to provide investigators the opportunity to collect preliminary data or as add on funds to combine with other funding sources to continue present research. Students working on degrees may find these funds especially appealing as they seek to complete graduate degrees. These grants may be used for supplies, equipment, salaries, travel or other appropriate uses by the recipient.

EAS will award one $2,000 grant in 1998 at the annual banquet. The award will be determined by July 1, 1998 with funds immediately available. Deadline for application is May 24, 1998. For information regarding proposal submission criteria contact: EAS Foundation for Honey Bee Research c/o Loretta Suprenant, EAS Secretary, Box 300A, County Home Rd., Essex, NY 12936.

CORNELL LOOKING FOR (A FEW GOOD) QUEENS

Dyce Laboratory for Honey Bee studies at Cornell University in Ithaca, NY is looking at genetic mechanisms of pest, parasite and pathogen resistance in honey bees as part of a honey bee, stock improvement program. This study requires the evaluation of a genetically diverse population of honey bees. To generate the required diversity, Dyce laboratory is asking that beekeepers from all over the country contribute one or two, high quality supercedure queens from last year, or one or two, high quality, locally-reared and naturally-mated queens from last year. A population assembled from queens that have been naturally mated in as many different locations as possible will ensure a broad genetic base for evaluation. All queens will be evaluated for a number of beneficial traits and the best will be included in the stock improvement program. Every beekeeper that contributes will receive a report on the initial stock evaluation. Target shipping dates are April 15th through May 15th, 1998. If you would like to support honey bee research that focuses on solving real problems faced by real beekeepers please call (607) 255-5443 and leave your name, address, phone number and number of queens you are able to ship.

AND YOU THOUGHT BEES WERE EXPENSIVE!

Agriculture Secretary Dan Glickman announced the availability of the annual report "Expenditures on Children by Families" which examines the cost of raising children to age 17. For a child born in 1996, the report estimates a middle-income family will spend $149,820 over the next 17 years to provide food, shelter and other necessities in raising a child. The estimates do not include the cost of childbearing or cost of a college education. For the average family, housing was the single largest expenditure on a child accounting for 33 percent of total costs over 18 years. Food was the second largest expense accounting for 17 percent of the total. Both the 1996 and 1995 annual reports are available as pdf files on the CNPP home page at http://www.usda.gov/fcs/cnpp.htm. A limited number of single printed copies are available by writing to USDA's Center for Nutrition Policy and Promotion, 1120 20th Street, N.W., Suite 200, North Lobby, Washington, DC 20036.

Washington Gets Tough

NEW RULES DEBATED

A proposed rule would establish an annual registration fee for bee brokers and a schedule of monetary penalties for violations of the apiary law.

The proposed annual registration fee for bee brokers is $100. Bee brokers pollinate crops using beehives owned by someone else. If a person acts as both a beekeeper and a bee broker, the lesser of the two fees would be waived. Fees for beekeepers range from $5 to $300. All fees are used to implement the apiaries law.

"Penalties would be assessed after a written warning," said Diane Dolstad, program manager at Department of Agriculture. "Violations may include failing to pay required fees, altering an official inspection certificate or refusing to identify apiaries or beeyards."

If the violation continues after the warning period, a civil penalty of $100 would be assessed. Penalties for repeated violations would increase to $500 and then $1,000 for the third and subsequent violations.

The apiary law protects Washington agriculture by facilitating the availability of bee colonies for pollination, promoting improved beekeeping practices and combating outbreaks of bee diseases or mite infestations.

More than 500 beekeepers are registered in Washington. Together, they own more than 60,000 hives. Honey bees are used to pollinate apples and other tree fruits, certain seed crops and berries. The value of honey produced in Washington last year was $2.5 million. The value of pollinated crops was over $1 billion.

OBITUARY

Richard C. Kehl, 46, of 1409 N. Second St., Watertown, WI owner and operator of Nibble Nook Restaurant in Watertown, died Wednesday, December 17, 1997, in Oconomowoc, WI.

He was born March 12, 1951 in Watertown, son of Arthur and Rose Kehl. He was a 1969 graduate of Hamilton High School in Hamilton, IL. He served in the U.S. Army in Germany and Iran for nine years. He was a member of American Legion Post No. 189.

Kehl was former office manager of Dadant & Sons Beekeeping Supply in Watertown; former sales manager of A.I. Root Beekeeping Supply Office in Medina, OH; former owner of Puter Mug in Watertown.

Surviving are a daughter, Jennifer of Watertown; two sons, Kevin of Watertown and Matthew, a student at the University of Wisconsin-Plateville; his parents of Watertown; a sister, Nancy of Watertown; a brother, Art R. (Cheri) of Bear Valley; his fiancee, Nancy Metzger of Watertown; an uncle, Ray Schutz of Watertown; nieces, nephews, other relatives and friends.

WISCONSIN PROUD

Clifford and Bernice Wolterstorff of Knapp received the Pioneer award at the WHPA annual convention at Eau Claire.

Bernice and Cliff have been beekeepers for over 40 years. Showing their love of honey, nurturing future producers and consumers. They have been active in the Wisconsin Honey Producers Association for over 30 years. Cliff has served as Dunn Co. president, vice-president, secretary-treasurer, also Northwest District Chairman and vice chairman.

In 1989, Cliff and Bernice were honored with the Wisconsin Beekeeper of the Year award.

August and Marlene Laechelt of La Valle, received the Pioneer award at the WHPA annual convention at Eau Claire. Although now retired, Augie and Marlene have an impressive record of accomplishments over the years, and they continue with projects promoting honey and education of beekeepers that they have initiated through the years.

Augie and Marlene were officers of the Sauk/Columbia Honey Producers for at least 18 years, and prior to that, were among the founders of the Waukesha Beekeepers, serving as officers there. In addition, Augie was president of the Wisconsin Honey producers.

In 1984, Augie created the Sauk/Columbia Honey Producers County Bee Yard. This beeyard has been a very successful fund raiser for the county group. As a full time beekeeper, he managed the county's 22 hives for many years, along with his own bee operation of up to 600 colonies. Some of this county money was spent to help with the purchase of a special video microscope for the UW-Baraboo which is also used at the beekeeper meetings to examine bees for tracheal mites.

Dave Marcy of Ogdensburg, was named Beekeeper of the Year at the 1997 annual convention of the Wisconsin Honey producers in Eau Claire.

Dave organized the Waupaca County Beekeepers Association about 20 years ago. He was president of that group for many years. He was president of the Wisconsin Honey Producers from 1992-1996. He has been the Northeastern District chair for many years. Dave has been a beekeeper for many years and for the past 10 years has been selling package bees.

Dave has a homespun sense of humor and is not afraid of change. Besides being a beekeeper, Dave is town Chairman for the township of St. Lawrence and drives school bus because he enjoys the kids. Dave and his wife Sandy have two sons.

Anna Kettlewell was named the 1998 Wisconsin Honey Queen at their convention in November. She is a Junior at the University of Wisconsin-Green Bay majoring in Public Administration with minors in Spanish and Music. She is the daughter of Derald and Mary Kettlewell of Greenfield.

NOVARTIS NOTES

Novartis Seeds, Inc., Vegetables has resumed sales of its popular Rogers Brand Athena cantaloupe seed. Novartis stopped sales last August following claims of poor seed performance, claims which Novartis disputed. Novartis Seeds has now instituted a waiver system for melon growers, transplant growers, and dealers whereby all risks of seed nonperformance are assumed by the purchaser.

Do businesses really want to stop federal regulators from interfering with free markets? Some do, but certainly not those businesses that regulators have chosen to protect from competition. For instance, Novartis, a large drug maker formed after the merger of Ciba-Geigy AG and Sandoz AG, registered a purportedly new product, Mefenoxam. Novartis relied almost entirely on an older pesticide's (metalaxyl) data base to support its safety claims for the new pesticide – and then canceled its Metalaxyl registrations with the EPA. In turn, the EPA has taken the position that, because of Novartis's cancellation, the Agency cannot register a competitive metalaxyl product from Nation's Ag, a much smaller company, as a 'follow-on' generic. As a result, nation's Ag's registration could be delayed for years. In the meantime, Novartis continues to sell metalaxyl under an extraordinary clause of its voluntary cancellation order that gave it two-and-a-half years to sell 'existing stocks.' Nation's Ag filed suit and alleges that the EPA's decisions have been arbitrary and capricious and violate the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the Administrative Procedure Act, and the Due Process Clause of the U.S. Constitution. It alleges that EPA failed to give adequate and meaningful public notice of its regulatory actions, that those actions implemented a secret EPA arrangement with Novartis that was intended to protect Novartis from competition, and that those actions unlawfully favored one manufacturer's safe product over another's. David B. Weinberg, a partner in the law firm of Howrey and Simon (Washington, DC) who represents Nation's Ag, said, "If EPA has the authority to do to others what it has done to Nation's Ag, it will be able to prevent growers and uses, as well as competing suppliers, from participating in decisions about what safe products and uses are eliminated."

CALENDAR

♦INTERNATIONAL♦

The Fourth Asian Apicultural Association Conference will be held March 22 - 27, 1998 at the International Convention Hall, Kathmandu, Nepal.

For more information contact Mr. K.K. Shrestha, Conference Secretary, G.P.O. Box 3226, Kathmandu, Nepal; FAX 00 977 1 524 509 / 00 977 1 536 747, phone 00 977 1 525 313; email: mfs@icimod.org.np.

♦CANADA♦

Eastern Canada Apicultural Symposium sponsored by the Maritimes, Ontario and Quebec will be held July 11, 1998 at Deschambault Research Station, Deschambault, Quebec.

This event will feature Dr. Nikolaus Koeniger, Mr. Jocelyn Marceau, Dr. Medhat Nasr and other beekeepers representing the Maritimes, Ontario and Quebec.

For information contact Paul Vautour 506-388-5127; Pat Westlake 519-565-2622; Peter Keating 418-251-6435.

♦CALIFORNIA♦

The Mt. Diablo Beekeepers Association offers a beginning to intermediate bookkeeping workshop for novice and hobbyist beekeepers. The workshop will be held in Martinez, CA. April 18 and is limited in size. The cost is $20 and includes membership for 1998 in the MDBA.

For more information contact: Steve Gentry (510) 254-8063.

The Sacramento Area Beekeepers Association offers two beekeeping workshops. Beginning Beekeeping is a one-day workshop, Saturday March 7, 1998 8:00 a.m. to 4:30 p.m. at the Sacramento County Cooperative Agricultural Extension Auditorium, 4145 Branch Center Road, Sacramento.

The Intermediate Beekeeping workshop is one day, Saturday, April 4, 1998 8:00 a.m. to 4:45 p.m. at the Sacramento County Cooperative Agricultural Extension Auditorium, 4145 Branch Center Road, Sacramento. For additional information please telephone Pam or Nancy at 916-451-2337, Tuesday through Saturday between 10:00 a.m. - 4:00 p.m.

♦ILLINOIS♦

The Heart of Illinois Beekeepers' Association (HIBA) will sponsor a Bees and Beekeeping short course at Miller Park Zoo in Bloomington on Saturday, March 14, 1998. The all-day course is designed to help members of the general public to become involved in beekeeping, and will provide the basic information and skills to do so.

To pre-register, please send your name, address, phone number, and $10 for materials to Rebecca Wenning at 21 Grandview Drive, Normal, IL 61761-4071. For additional information, phone (309) 454-4164. Rebecca also accepts e-mail at cjwennin@ilstu.edu. Pre-registration deadline is March 1, 1998.

♦INDIANA♦

Tri-State Beekeepers Meeting will be held Saturday April 25, 1998, 8:00 a.m. to 3:30 p.m. at Indiana University-Northwest, Gary, Indiana. It is sponsored by Northwest Indiana Beekeepers (host), CookduPage Beekeepers Association, Indiana Beekeepers Association, Michiana Beekeepers Association, Southwestern Michigan Beekeepers Association.

Registration is $7/family, $5/individual and $2/student.

For more information contact Ron Fischer, 708-524-0351; Ken Theis, 219-766-3618; Paul Johnson, 616-926-6695; Jim Curlee, 219-289-1992; Dave Laney, 219-656-8701.

♦KENTUCKY♦

The Indiana and Kentucky State Beekeepers Associations will hold a joint meeting April 3-4, 1998 at Kentucky State University, Frankfort, KY

For information contact Dr. Greg Hunt (765) 494-4605/ gh@spider.entm.purdue.edu; Dr. Tom Webster, (502) 227-6351/ twebs01@ukcc.uky.edu; Jed Davis, (502) 857-2272 or Dave Laney, (219) 656-8701.

♦MAINE♦

The Maine State Beekeepers Association will hold the 1998 Annual Meeting on March 28th at Verrillo's Restaurant located at Exit #8 of the Maine Turnpike.

Dr. Dewey Caron, University of Delaware and Chairman of the Board, EAS will discuss Honey Bee Communication and Apiculture in South and Central America. Matthew Scott, Past President of both the MSBA and EAS will address Bee Pasture in Maine.

The meeting will include an auction and a honey cookery contest. Lodging is available adjacent to Verrillo's at Howard's Johnson's (207) 774-5861. For more information contact Joanne

Continued on Next Page

Smokey Dents

Advertisers

Missing

Ed Hughes

We had to buy a couple of new bunches of bees this Spring after we lost two of our hives over the Winter. When I tell the locals around here that we lost our bees last Winter, they always ask, "Where did they go?" or "Did they all leave?"

One old rancher asked me if they were stolen. What he really wanted to ask was whether they had been "rustled." But the "r" word in ranching country is too highly charged, and can only be hinted at in everyday conversation.

I assured him that they weren't stolen.

"About how many do you think you lost?"

This is a tough question because bees at the height of the season can be operating at 40,000 to 60,000. But, since we probably lost them in the late Fall and they were a little weak even then, I guessed a couple thousand in each hive, and I told him so

He looked at me very seriously and asked, "You lost 4,000 head to Winter kill?"

From a cattleman's perspective I guess you could call them each a head, so I said yes, it would have been about 4,000.

"All of them lost?" he asked, incredulous.

"Every last one."

"Where did you find their little carcasses?"

"We never did," I said, "they were just gone."

His face grew suspicious again: When a cattleman can't find the carcass, he knows for certain that something fishy is going on.

"Where do you think they would have gone?" he asked gently, giving me, the greenhorn bee rancher, the opportunity to draw the obvious conclusion.

Realizing too late that I should have nipped the cattle/bee analogy in the bud when it first came up, I tried backtracking.

"Bees are different," I tried explaining. "When they have a mind to take off and go somewhere else, they just do. There's no stopping them."

"Did you see any tire tracks around where you used to keep them?"

"I think they may have flown off on their own."

"Probably they were enticed somehow."

"Probably," I said with a sigh.

"Have you reported it to the government yet?"

"No," I said. "Should I?"

"Of course you should," and he said it with complete confidence. "When you lose a whole herd like that, they have programs to get you back on your feet."

"I suppose they do," I said and looked at my feet.

"They can even help you find them."

"They can?" I asked, thinking that they did, after all, put men on the moon.

"How were they marked," he asked, reasoning I suppose, that we must have tiny brands on them somewhere. I wanted to say they had little black and yellow bar-codes on them, but I didn't.

"When I look at the flowers in the fields around here, I can sometimes spot our bees because they're darker than most bees."

"I'm the same way," he said. "I can tell one of our steers from a quarter mile off."

I looked at my feet again, not knowing what to say.

"Tell you what," he said, "I'll have a look around for you. I get around this county quite a bit, and nobody'll think that I'm looking for your bees for you."

I could picture him wandering through my friend Jim Sheaffer's beeyard.

"These bees here look kinda dark to me, Jim."

"You're right, they are darker than most of my others."

"Where did you get 'em exactly?"

Jim will probably never give me another free super as long as I live.