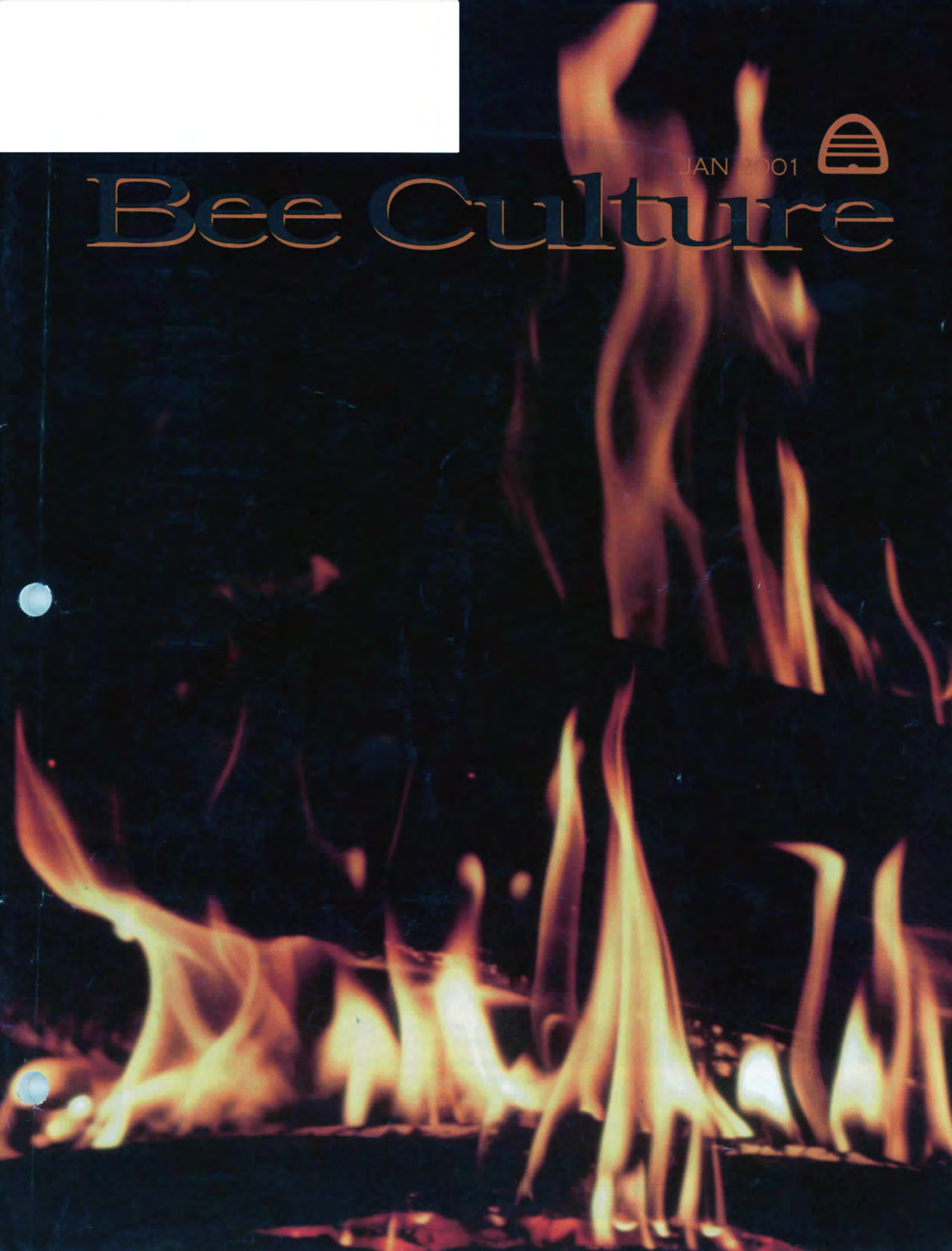


JAN 2001



# Bee Culture



# Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

JANUARY 2001 VOLUME 129 NUMBER 1

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# MAILBOX

## Yes To Wise Guy

I read your publication usually within three to five days after arrival. There are always timely articles that I feel help me to do a better job of beekeeping.

From the mailbox I note that some subscribers want everything signed (particularly, Wise Guy). It appears they can't accept someone's opinion unless they know who it is – not so – your "Wise Guy" and others have diverse opinions, but let's get these ideas out here in front of people in the industry. It will help all of us. Please keep your articles as they are – including "Wise Guy." We need them.

Your staff does very well month in and month out. Take a bow. You deserve it.

Phil

## Crystallization Woes

I just finished reading "Storing Honey" in the November 2000 issue. This article says that honey can't crystallize if frozen. I wish whoever wrote that would come out here and tell that to my honey. I tried for years for a way to stop honey from crystallizing, including freezing. I have a very full freezer right now with nothing but crystallized honey. And don't tell me it isn't frozen. I have ice and meat in it and they all are frozen solid. I have even warmed mine up in a microwave till it was liquid. I have put it in the oven at 140° etc. till it turned liquid again. A few months after I put it back in the freezer, it has crystallized again.

I have noticed though, that it crystallizes faster in one freezer than the other. Maybe at zero or below it may not crystallize but I don't know the temperatures in my different freezers. Maybe I'll write an article on what temperatures actually stop the crystallization process, 'cause it isn't freezing.

Frank Chamberlain  
Asheboro, NC

## Surefire Requeening

I thought your readers might be interested in knowing a sure fire way to requeen a hive of bees that has gone queenless and has a laying worker. It might be a little trouble but it's well worth it in the long run and it almost never fails, unlike other methods which almost always fail.

Get at least four to five pounds of bees from a strong stand or three frames of bees and brood from the brood chamber along with a new queen. If you use four to five pounds of bees put them in a shallow or medium super, if you use three frames of bees and brood put them in a hive body. You will have to take them a few miles away or else the bees will just return to the hive you took them out of.

Feed the bees sugar water for about two weeks until they get started good and then put them on the queenless hive with two pieces of newspaper between. The bees will protect their new queen and take over the queenless hive and the laying worker will not be heard from again.

This is probably the only successful way to requeen a hive with a laying worker and the new bees along with the ones in the queenless hive will make an excellent hive of bees.

Norman Wallin  
Chilhowie, VA

## Puerto Rico News

Mr. Carlos Rodriguez, executive director of the Farmers Insurance Corporation announces that his agency granted \$1.57 million to 8,000 farmers.

In addition, the United States' Federal Crop Insurance Corp (FCI), granted \$5.5 million to 10,000 farmers.

A total of \$7.7 million were granted for insurance. Several beekeepers got the benefits of these incentives.

The National Meteorological Office of the Dominican Republic – A Latin American nation located in the Caribbean – reports that strong winds hit the northern region, affecting the trees that provide flowers to the honey bees.

Since the winds didn't reach the speed of a tropical hurricane, the insurance companies don't have to pay.

In 1998 tropical hurricane George hit the country, destroying trees and reducing the amount of flowers. So, honey production is smaller than in previous years.

The Dominican Republic controls the honey market of the neighboring archipelago of Puerto Rico – an American protectorate since 1898.

L.M. Medina  
Lares, Puerto Rico

## Thanks For Voting

I want to thank all of you who voted and took the time and effort to photocopy and mail to me a copy of your referendum ballot. Especially appreciated were the notes some of you attached for me to read. Response was greatest from Florida, New York, and the northern tier of states. Since we achieved our objective up to this time, the ballot portion containing the poundage and how you voted, has been disposed of, and the findings were shared with only Joe Rowland, who as you know was instrumental in explaining the unsavory details of the proposed changes to the NHB in his letter that was mailed to several thousand beekeepers and others.

Please remember, we need your vote once again next year, or whenever the termination referendum will be scheduled, to bring the NHB, as it is presently operating, to an end. Then we can either start with a board that promotes only honey that is produced in this

Continued on Next Page

# MAILBOX

country, or any other specifics we might choose to require of the board, or perhaps no official board at all would work if a voluntary association of interested persons were to form. Do you suppose such a group already exists in the form of the American Honey Producers?

*Leon Moyer  
Rogersville, MO*

## Final Referendum

Due to the inability of the National Honey Board to promote our domestic product thereby helping beekeepers to gain a fair market price for honey, it is necessary at this time to conduct a referendum to terminate the current program. The American Honey Producers Association has started a petition drive to call the NHB to a final vote as soon as possible.

By terminating the current National Honey Board, we can with time, effort, and good judgment, establish a new program that will certainly benefit honey producers in the USA far greater than the current generic NHB has. Our new program will consist of a Producer Only board.

The American Honey Producers Association feels the recent landslide vote against the NHB is a clear indication that beekeepers believe that it is time for change. This was clearly a vote of dissatisfaction against generic promotion. If you would like to help, please contact the office of the AHPA.

*AHPA  
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*Respectfully  
The AHPA Executive Committee*





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	251 500	\$4.60	251 - 500	\$4.10
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# INNER COVER



**Y**ou are going to see a lot about profitable colony management in this magazine over the next 12 months or so. An awful lot. And one critical aspect to profitability is that there is no doubt that Integrated Pest management in a bee hive is the way of the future. Hard chemicals have their place, no two ways about it, but there are other tricks of the trade that you can use to reduce the use of these

poisons.

Starting with queens. What is your queen producer doing to enable you to be a better beekeeper? Are your queens absolutely free of Nosema? How do you know? Is your producer feeding Fumidil-B? How do you know? A queen infected with Nosema has a life span in your colony of about three weeks, then she's history. Whose fault?

How about hygienic behavior? Is your producer selecting for hygienic behavior? The tests are easy, the results are measurable and absolutely every queen producer should be selecting for this trait in at least some of their queen lines being sold by their operation. If they're not, why not? And if they are, how good are their queens' progeny at cleaning up a hive? How do they know? How do you know?

Tracheal mite resistance is easily available. Buckfast bees, from Texas or Canada, and other hybrids as well also have it. Plain and simple. In reality, not another colony in the U.S. should die from a tracheal mite infestation. Period. Are your queens resistant to tracheal mites? If not why not? How do you know your queens will produce resistant bees? What happens when they don't?

What about *Varroa*? Is your producer using stock tolerant, or resistant to *Varroa* or at least selecting for *Varroa* resistance? If not, why not? How do you know?

And what about mating? And American and European foul-brood control? Any help there? How do you know?

I'm not picking on queen producers. Like all markets, producers sell what customers ask for, and ask for, and ask for. And if they can't sell what they have, they'll get something they can sell. It's not fuzzy math, but simple economics. Produce and sell queens that keep customers in business or (and this is the right answer) go out of business.

But YOU have to ask. And ask. And ask. And ask again and again and again every producer you talk to. And, be ready to do two things. First, you've got to be ready to pay for what you get. A producer who invests in producing hygienic queens that ARE hygienic will spend time and money doing so. Feeding Fumidil-B is expensive. Buying Breeder queens to boost tracheal mite resistance, *Varroa* resistance, plus produce honey and remain gentle enough to work costs money. You will pay more for better queens, and queens that have these traits are better queens.

More importantly, producers who *say* they have better queens, and don't, should pay, but only if they know about your problem

with their product. Misleading advertising will be exposed, (on this page) as will the opposite - bees that do what producers say they will do. It works both ways. It has to, to be fair.

The first step to intelligent and progressive pest management is investing in bees that do at least some of the work. The market YOU will decide what works and what doesn't. And that same market will dictate what producers can, and can't sell.

By and large, queen producers want to satisfy their customers. But they need to know what's important, they need to have at least some reaction time, they need some 'biological lenience' and they need the investment of their customers to proceed and to continue.

But they also need to be honest, to actually invest those dollars in their product, and to acknowledge that if what they said, and what they did wasn't quite the same, they'll make it up to you. Simply put, if you don't stay in business, they don't stay in business, and it's time that was made clear to everyone in the business.

We'll NEVER get off the chemical treadmill if we don't do things differently than we are doing them now. Beekeepers and queen producers can do it together. Or, they can sink together. This year start asking when you buy queens, and listen to what your queen supplier tells you. It will make a difference.

And now, the time is here, to clean your smoker from all the crud from last year, and make very sure your hive tool is clean, sharp, and ready.

## Ask Questions . . .

# ? DO YOU KNOW ?

## Beekeeping History

Clarence Collison  
Mississippi State University

Beekeeping is an ancient art that has fascinated man for centuries. Modern methods of beekeeping came very rapidly following the invention of the movable frame hive. Other inventions soon followed that made large-scale, commercial beekeeping possible. Beekeeping history is rich with keen observers and outstanding researchers, teachers, inventors, manufacturers and pub-

lishers. The industry today is built upon a foundation of knowledge that has been passed down through the ages. How well do you know your beekeeping history and the individuals that made significant contributions to it?

Take a few minutes and answer the following questions to see how familiar with this important topic.

*The first 9 questions are true and false. Place a T in front of the statement if entirely true and an F if any part of the statement is incorrect. (Each question is worth 1 point).*

1. \_\_\_ Eva Crane was the original director of the International Bee Research Association.
2. \_\_\_ Midnite honey bees are four-way hybrids developed from inbred lines derived from the carniolan race.
3. \_\_\_ Rev. L. L. Langstroth is credited with the invention of the movable frame hive.
4. \_\_\_ Italian honey bees were the original race of bees brought over by the colonists.
5. \_\_\_ O. W. Mackensen developed forceps for transferring honey bee eggs.
6. \_\_\_ Dzierzon is credited with developing the theory of parthenogenesis in the development of the drone honey bee.
7. \_\_\_ Mehring invented the first method of extracting honey from the comb by centrifugal force.
8. \_\_\_ The queen mailing cage was developed by Moses Quinby.
9. \_\_\_ Huber determined that queens could be reared from very young worker larvae by transferring them to queen cells.

(Multiple Choice Questions, 1 point each)

10. \_\_\_ The earliest archaeological evidence of man's association with bees comes from rock paintings located in \_\_\_ showing the harvesting of honey by hunting for wild nests of bees.  
A. France; B. Germany; C. Italy; D. South Africa; E. Spain
11. \_\_\_ Responsible for developing a technique to separate honey from honey adulterated with high fructose corn syrup.  
A. C. C. Miller  
B. Jonathan W. White Jr.  
C. E. J. Dyce  
D. Wayne Stoller  
E. Charles Dadant
12. \_\_\_ The authors Frank C. Pellett and J. H. Lovell published books dealing with:  
A. Queen Rearing  
B. American Honey Plants

- C. Swarm Prevention
- D. Production of Comb Honey
- E. Beeswax

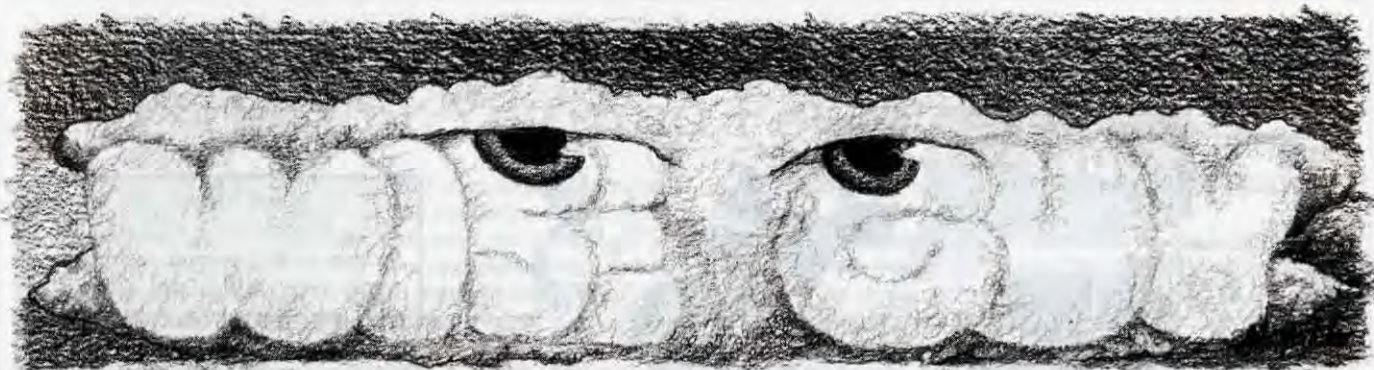
13. \_\_\_ Individual primarily responsible for developing the Midnite and Starline bee breeding programs.  
A. G. H. (Bud) Cale Jr.  
B. H. H. Laidlaw Jr.  
C. W. C. Rothenbuhler  
D. C. L. Farrar  
E. M. H. Haydak
14. \_\_\_ Sam E. McGreger and John B. Free published books dealing with:  
A. Honey Bee Pheromones  
B. Royal Jelly  
C. Nectar Secretion  
D. Crop Pollination  
E. Bee Diseases
15. Bee hives made of wicker or coils of straw are called \_\_\_\_\_

Please match the following book titles with the appropriate authors.

- |                     |                      |
|---------------------|----------------------|
| A) H. A. Dade       | B) O. Mackensen      |
| C) W. C. Roberts    | D) H. H. Laidlaw Jr. |
| E) C. C. Miller     | F) Eva Crane         |
| G) G. M. Doolittle  | H) Carl E. Killion   |
| I) R. E. Snodgrass  | J) Dorothy Hodges    |
| K) Karl von Frisch  | L) A.I. Root         |
| M) L. L. Langstroth | N) Charles Dadant    |

16. \_\_\_ Scientific Queen Rearing
17. \_\_\_ Fifty Years Among The Bees
18. \_\_\_ Anatomy Of The Honey Bee
19. \_\_\_ The Dance Language And Orientation Of Bees
20. \_\_\_ The Pollen Loads Of Honeybees
21. \_\_\_ Instrumental Insemination Of Honey Bee Queens
22. \_\_\_ Contemporary Queen Rearing
23. \_\_\_ The Archaeology Of Beekeeping
24. \_\_\_ ABC Of Bee Culture
25. \_\_\_ Honey In The Comb

ANSWERS ON PAGE 38



Remember when you were young and you and your friends had a secret club? You met in the tree house in the back yard or in a clubhouse made with old boards and 'stuff'. You kept your meetings secret and kept out people that you didn't want knowing your business. These clubs could keep people out of them based on the current membership's feeling about that person.

Private clubs and organizations are always great if you are a member, and you enjoy the benefits of that membership. As with the children's clubs, private organizations choose new members based on the feelings of the current membership. You approve of their business dealings and you approve of their ideas and make sure they think like you before they become a member. Private organizations can exclude people that have like interests but don't lockstep with the organization's ideas. By doing this, by simply excluding some people, you can manipulate an industry's perception of that 'club' so it looks like that club speaks for the whole industry.

It seems that the National Honey Packers and Dealers fits the description of a closed, secret organization. What is their main goal? I would hope it would be to further the honey industry in the U.S. I would hope they would challenge their members to increase honey sales throughout better marketing, packaging and other areas of the sales process. I would hope they would try and improve the image of honey by putting the best product on the shelf at a fair price. I would hope they would have the courage to keep the quality at a high level due to the Cadillac Image honey has compared to other sweeteners.

What standards do the Na-

tional Honey Packers and Dealers have for honey? As the "Gate Keeper" for a whole industry you have an obligation to raise the image and quality of the product you sell. They should be responsible for the image of honey. They should raise the level of pride in this business. Their name appears on most of the products...so shouldn't they want the best? If you only follow minimum requirements, however, are you helping the industry?

I just read the International Trade Commission (ITC) Antidumping testimony (the public version) and found the document very interesting (this is against both China and Argentina). The first thing that jumped out at me was that the National Honey Packers and Dealers (from the U.S.) are sharing their attorney with the Chinese. Are their interests that close? Do you think that they both think the same? The current President of an Ohio Honey Packing Business testified that "The market believes that most Chinese honey does not have good flavor characteristics" He further testified that some of his customers specify that they want NO Chinese honey in their product. Also, he says he has customers that want no Chinese honey because of the 'flavor profile'. Does this mean that it's bad? This

is the same person who wrote letters to the Editor of this and other journals, and came to and spoke at meetings telling us about Quality Assurance. But he "adulterates" his American honey with a definitely poor quality Chinese honey.

But there's more. He later testified that most people can tell the difference between Argentine white clover honey and U.S. white clover honey. I thought when a packer was trying to purchase your honey he said he could get 'the same' white honey from Argentina for less money. Maybe that was just not the truth?

Another one of the people who testified was a large importer from the east coast. He said Argentine honey is a great blending honey due to its mild flavor going undetectable when blended with domestic honey. This seems to me that you want the flavor of domestic honey so you stretch it with Argentine honey. Can corn syrup be far behind?

I find this closed organization interesting. The National Honey Packers and Dealers will not let American Beekeepers attend their meetings, but they seem to be openly cooperating with the Chinese. Birds of a feather...

*Wise Guy*



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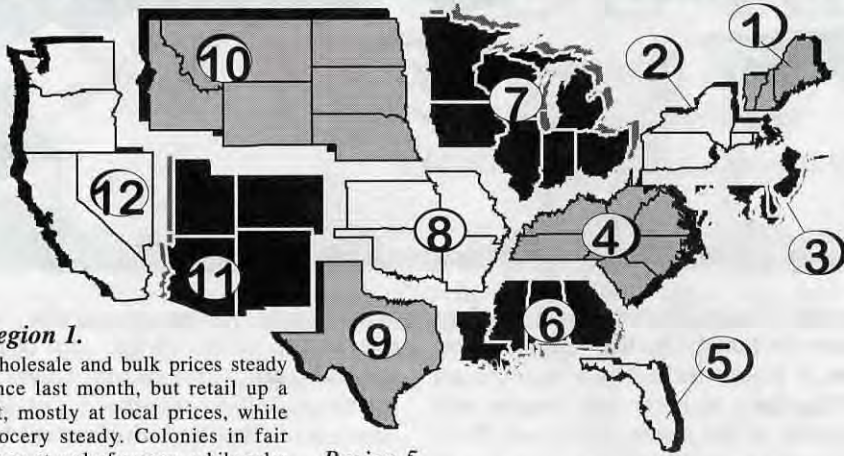
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# JANUARY - REGIONAL HONEY PRICE REPORT



Hats off to **Joe Mayer**, one of our Honey Reporters from Region 11. Joe has been sending in reports each month for **30 years**, that's right, 30 years! He's retiring at age 85. "I've always enjoyed this job," was his farewell message. Joe, thanks a million for your help and dedication. We wish you a long and happy retirement. You deserve it!

## Region 1.

Wholesale and bulk prices steady since last month, but retail up a bit, mostly at local prices, while grocery steady. Colonies in fair shape at end of season, while sales are, again, stronger in local markets than in large stores.

## Region 2.

Pails and bulk prices up, but wholesale and retail prices the same as a month ago. Colonies in pretty good shape at season's end, and sales average to a bit stronger than expected.

## Region 3.

Pails and bulk prices up a bit, but wholesale and retail steady. Colonies in fair condition, some not quite so fair, and sales outlook encouraging.

## Region 4.

Prices steady across the board since last month, and sales are right where sellers expect, no surprises good or bad. Colonies in generally good shape, but poor late flows may mean hungry bees.

## Region 5.

Pail prices steady, as is most wholesale, but both bulk and retail have dropped in price. Colonies in pretty good shape throughout the state, but sales are still slower than expected.

## Region 6.

Prices steady across the board since last month. Colony conditions mixed, with lingering drought problems still around. Sales are at best steady and where expected, but reduced supplies haven't affected price, yet.

## Region 7.

Pail, bulk and wholesale prices steady, but retail down some since last month. Colonies in pretty good shape generally with some problems showing up with mite crashes. But sales stink according to all our reporters.

## Region 8.

Pail prices down, bulk steady, but wholesale and retail up a bit since last month. Sales steady to down though and colonies, for most, in only average condition.

## Region 9.

Pail prices down this month, but wholesale and retail steady with bulk up a bit. Colonies in mixed shape, probably due to rains, or not. Sales though, like other regions, stink.

## Region 10.

Prices steady except up a little for wholesale, but sales only average. Colony conditions mixed, from terrible from mites to great.

## Region 11.

Pails and retail dropping a bit since last month, but bulk and wholesale remain steady. Sales about average to up a bit and colony conditions strong, and getting ready for almonds.

## Region 12.

Pails and bulk steady, wholesale prices down and retail prices up for the month. Colonies in good to great condition this year, with lots of bees showing up for almonds.

Reporting Regions													History			
	1	2	3	4	5	6	7	8	9	10	11	12	Summary	Last	Last	
													Range	Avg.	Month	Yr.
<b>Extracted honey sold bulk to Packers or Processors</b>																
<b>Wholesale Bulk</b>																
60# Light (retail)	66.51	83.00	74.00	70.80	75.00	64.67	64.50	63.00	66.67	62.00	78.00	75.00	45.00-85.00	69.29	68.32	69.25
60# Amber (retail)	63.49	73.88	68.00	70.25	67.50	62.50	61.25	57.60	70.00	62.00	60.00	68.36	54.00-85.00	66.07	67.75	66.15
55 gal. Light	0.59	0.65	0.65	0.63	0.60	0.60	0.60	0.65	0.65	0.56	0.62	0.65	0.50-0.82	0.62	0.61	0.60
55 gal. Amber	0.53	0.63	0.58	0.63	0.55	0.54	0.55	0.58	0.50	0.50	0.56	0.58	0.48-0.68	0.57	0.58	0.58
<b>Wholesale Case Lots</b>																
1/2# 24's	29.24	30.48	33.12	34.67	33.12	25.83	28.32	33.12	33.12	33.12	33.12	33.12	23.65-45.00	30.71	30.47	28.43
1# 24's	42.28	41.43	48.00	45.47	42.20	44.50	40.36	40.20	42.00	42.00	48.00	40.40	26.10-60.00	43.85	43.77	43.73
2# 12's	38.05	38.09	45.60	44.45	39.60	36.20	37.06	41.40	42.00	31.80	40.46	42.00	29.40-52.58	39.39	39.21	39.07
12 oz. Plas. 24's	36.01	38.90	44.40	34.51	34.80	40.40	36.38	36.00	42.00	35.40	36.00	38.40	27.60-48.00	37.26	36.48	37.43
5# 6's	39.83	41.15	54.00	48.75	42.17	42.90	39.17	39.00	42.17	37.50	42.17	42.17	30.50-54.00	42.02	42.27	41.93
<b>Retail Honey Prices</b>																
1/2#	1.77	1.73	2.83	2.17	1.39	1.67	1.59	1.69	1.39	1.49	2.63	2.83	1.09-3.70	1.80	1.74	1.76
12 oz. Plastic	2.24	2.41	2.90	2.29	2.46	2.28	2.00	2.47	2.62	1.85	1.99	2.25	1.19-3.00	2.31	2.20	2.26
1 lb. Glass	2.81	2.58	3.00	3.33	2.80	2.67	2.41	2.70	3.61	2.39	3.49	3.00	1.59-4.85	2.88	2.67	2.73
2 lb. Glass	4.29	4.41	4.80	5.51	3.97	3.75	3.99	5.12	4.29	3.41	3.99	5.00	2.99-7.00	4.39	4.51	4.50
3 lb. Glass	6.28	6.95	6.80	7.31	5.15	6.50	5.70	6.50	7.25	5.79	6.49	6.77	3.79-10.00	6.51	6.22	6.17
4 lb. Glass	6.71	6.75	7.10	8.58	7.10	7.53	6.92	7.99	6.79	7.10	7.70	7.10	6.05-12.00	7.26	7.07	7.66
5 lb. Glass	9.18	9.55	11.00	11.02	10.00	8.90	8.73	10.99	10.45	7.90	8.89	10.45	7.89-14.00	9.46	9.34	9.13
1# Cream	2.95	3.28	3.11	3.57	3.11	3.16	2.71	2.89	3.11	2.29	4.00	3.00	2.25-4.00	3.08	3.12	3.32
1# Comb	4.15	4.31	3.60	4.11	4.43	4.25	4.13	4.49	3.76	4.43	5.00	4.50	2.92-6.00	4.33	4.10	4.25
Round Plastic	3.52	3.32	3.60	3.88	3.90	3.50	3.67	3.99	2.00	3.90	4.00	3.90	2.00-6.00	3.69	3.54	3.95
Wax (Light)	2.46	3.40	3.00	1.63	2.76	3.35	2.13	1.88	1.30	2.76	1.95	3.00	1.25-4.50	2.54	2.39	2.35
Wax (Dark)	2.08	2.38	2.75	1.38	2.55	3.20	2.50	2.05	1.30	2.55	1.50	2.55	1.00-4.50	2.14	2.18	2.08
Poll. Fee/Col.	36.36	43.75	32.50	36.50	25.00	40.50	37.57	40.00	30.00	39.17	39.17	32.00	25.00-55.00	37.52	37.48	37.61



# The American Beekeeping Federation Works For You And For Our Industry

The Directors of the ABF recognize that some of you will probably begin to believe the misstatements and accusations of some individuals and organizations if those misrepresentations and assertions are repeated often enough, and go unanswered long enough. Apparently, even some publications turn to our critics and detractors as the "source" of the slanted and sometimes disturbingly erroneous information about our policies, goals, and accomplishments.

The integrity and honesty of the American Beekeeping Federation and its members have been assaulted by slander, misrepresentation and purposeful omission. We condemn this assault. We believe that you deserve all the facts, not just our opponents' rhetoric, hyperbole and misrepresentations. Therefore, we are taking this opportunity to explain to the entire industry what we have been doing, are doing, and plan to do.

## THE ANTIDUMPING CASE

After careful study, the ABF decided not to become a petitioner in the new antidumping case. This was not an easy decision to make, but in the end, it was a unanimous decision of the ABF Board of Directors.

Every ABF Director would like to see some sort of curbs on honey imports, but all had concerns about the prospective cases as they were presented in April 2000. It was not simply a matter of recreating the 1994 case against China. Proving dumping by a free-market country (Argentina) is far more difficult than against a controlled-market economy (China). Moreover, potential dumping penalties, quotas and tariff projections were far lower than in the 1994 case. Conversely, the projected legal expenses were far higher.

We went back and analyzed the contribution pattern in the earlier case. In 1994 and 1995, a total of \$311,637 was given for antidumping by 840 persons. In the current case, we were looking at a cost of \$750,000 or more. Could the same contributors be expected to meet the new challenge? In 1994-1995, only 64 persons from all national organizations combined gave \$1,000 or more; only 83 persons gave \$500 to \$999. So, while the benefit to all U.S. producers was, indeed, considerable, the cost of providing this benefit was shouldered by a relative handful of producers.

And, the ABF membership shouldered about two-thirds of the cost of the successful case against China. Having been maligned continually over the financial matters, even as they carried the load on the 1994 case, the ABF Directors were determined that they would commit to paying no more than 50 percent of the cost of any new antidumping cases. Unfortunately our erstwhile partners would not accept responsibility for the other half. Nor would they commit to working harmoniously with ABF to pursue this and other joint goals.

In the end, the ABF Directors decided that this activity was not where the ABF wanted to spend its funds. It was felt that the ABF could better benefit its members by focusing its resources on securing temporary and, ultimately, permanent federal agricultural policy changes to benefit beekeepers and obtaining other objectives as directed by vote of our membership. However, even though ABF would not become a petitioner in the case, the ABF did commit to, and has provided important assistance to, the petitioners and their attorneys in the new case. Since the inception of the new cases, the ABF staff has spent several hours providing information to assist the petitioners' cases and the government investigation. You may have heard rumors about the letter the petitioners requested ABF to send to the Department of Commerce outlining ABF's position. We sent the letter as requested, the petitioners included it in their petition, and, the petitioners' attorney wrote us: "We really appreciate your getting us such a helpful letter by today." And later, after we sent additional information: "Your quick response to our requests for information allowed us to make a filing this morning.... We greatly appreciate the assistance you quickly gave us."

As befits a democratic organization like the ABF, our members were urged to examine the issues and contribute to the antidumping case if they felt so inclined. It also appears that many ABF members are actively supporting the case financially; in fact, the petitioners claim that 25 percent of the ABF's beekeeper membership has made contributions.

## THE LDP/HONEY LOAN PROGRAM

We hope you will soon have in your pocket concrete evidence of the ABF commitment to assisting our members in ways other than the antidumping case. But, again, there has been a lot of misinformation spread about the loan deficiency

payment for 2000-crop honey. Who was responsible for getting it? Who did nothing?

Here's what happened: The ABF and the AHPA issued a joint statement urging Congress to provide much needed financial assistance for America's beekeepers. The appeal germinated in the Senate, where the AHPA has a special relationship with Sen. Thad Cochran of Mississippi, who is chairman of the Senate Agricultural Appropriations Subcommittee. With Sen. Cochran on board, attention turned to the House Agricultural Appropriations Subcommittee and its chairman, Rep. Joe Skeen of New Mexico. The AHPA's lobbyist asked the ABF's lobbyist to help, and the ABF was able to gain Rep. Skeen's approval where the AHPA could not. In addition, the ABF secured other critical support for the Honey Marketing Assistance Program in the all-important Conference Committee.

Who did what is not the important part of this story. The important part is that both organizations and their Washington lobbyists were able to capitalize on relationships they had been developing over several years. This highlights the necessity of ongoing work in Washington. The ABF is committed to building long-term relationships in Washington with Congress and Congressional staffers. The immediate goal of this effort is to secure financial support for beekeepers in the next farm bill.

## WORKING ON THE NEXT FARM BILL

We have already taken several steps to accomplish these goals. We have presented fruit baskets to the members of the House Agriculture Committee. The baskets were filled with bee-pollinated fruits and nuts, seeds for other bee-pollinated crops, honey, and beeswax candles, etc. Also included were honey recipes, information on the benefit of bees to agriculture, and legislative issues of the industry. Our plans are to present similar baskets to other key members of Congress. We are also preparing an information/resource file on the industry and on bee-honey issues which we will supply to each Congressional office.

To be successful in Washington, we have to be united in our efforts. If one group asks for one thing and another group asks for the opposite, Congress will take the easy way out and do nothing. This also applies to the federal agencies, such as EPA and USDA.

And for the industry to be successful in Washington, your Congressman has to know that bees are important to his district and state. Each of us needs to have periodic contact with his Congressman. Remember, campaign contributions help them remember you. You don't have to be Mr. Moneybags; a \$50 or \$100 check goes a long way (remember to send personal, not company checks). If you aren't sure who your Congressman is or how to contact your Senators, ask your public library, your local newspaper, or contact the ABF office for assistance.

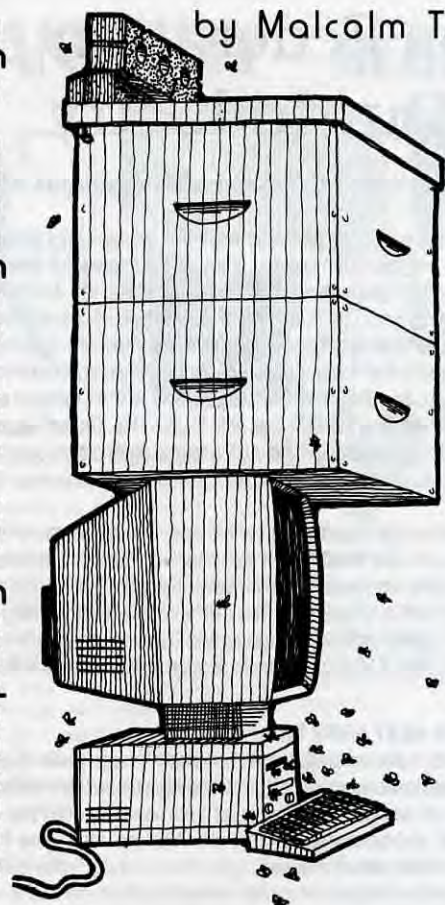
## A FEDERATION OF ALL INTERESTS

The American Beekeeping Federation includes members from every segment of the industry. A year ago we re-structured our Board of Directors to ensure that decisions are coming from a broader base. Even so, honey producers are our largest group of members, the backbone of our organization. No decision of the ABF membership nor the ABF Board of Directors (nor the ABF Executive Committee before that) has been contrary to the interests of our honey producer members.

To learn more about the ABF, write us at P.O. Box 1038, Jesup, GA 31598, or visit our website <[www.ABFnet.org](http://www.ABFnet.org)>.

*ABF Board of Directors: President Clint Walker III, Rogers, Texas; Vice President Pat Heitkam, Orland, Calif.; Past President David Hackenberg, Lewisburg, Pa.; Executive Director Troy Fore, Jesup, Ga.; Directors: Brent Barkman, Hillsboro, Kans.; David Ellingson, Odessa, Minn.; Judy Guleson, Britton, S.D.; George Hansen, Colton, Ore.; Douglas McGinnis, Edgewater, Fla.; Jay Miller, Blackfoot, Idaho; Fred Rossman, Moultrie, Ga.; Gus Rouse, Captain Cook, Hawaii; Darrel Rufer, Waverly, Minn.; Rick Sutton, Lancaster, Ky.; Daniel Weaver, Navasota, Texas; and Reg Wilbanks, Claxton, Ga.*

by Malcolm T. Sanford



## The Beekeeping Bibliography

periodicals formerly kept in individual offices of the Division. Material from medical, biological, agricultural, and other non-beekeeping periodicals and abstract journals were indexed regularly by the librarian to reflect the changing interests of the scientists employed by the Division of Bee Culture. Most articles selected were obtained from the original rather than being added unverified.

"In 1942, the Bee Library, along with other Bureau libraries of the Department of Agriculture, became part of the Department Library - later the National Agricultural Library (NAL). The Bee Library and Bibliography became the Bee Culture Branch of the National Agricultural Library until it was phased out in 1972. The Bee Culture Branch Library during its existence was supported heavily by the Apiculture Research Branch of the Agricultural Research Service. This support provided for an assistant to the librarian whose duties included preparation of summaries from foreign articles selected for inclusion in the Bibliography.

"The Bibliography was retained at the Beltsville Bee Laboratory and in 1975 a commitment was made to prepare the Bibliography for computer retrieval. In 1976, the Bibliography was microfilmed to preserve the file integrity because the individual index cards had to be transported to other locations for Key punching. One such location was the West Virginia prison system where female inmates used the Bibliography to learn Key punching. From the key punch cards the Bibliography was transferred to USDA's Prime computer in the Famulus format. The Bibliography was edited many times by various Bee Laboratory personnel and a hard copy was finally produced. However, there was no easy way to convert the Bibliography from the Famulus format to an IBM compatible format. Therefore, personnel at the Laboratory scanned the hard copy of the Bibliography into an IBM compatible word processor, and after more editing converted it into the present format; a 12 field delimited ASCII format suitable for import into any bibliographic program.

"The Beekeeping Bibliography with over 30,000 records ceased in 1972 and only a few entries were made after that date. The database of the NAL "CAIN" (Cataloging and INDEXing) was developed and made functional by NAL in 1970, then in 1976 renamed "Agricola" (AGRICultural OnLine Access). Agricola consists of over 3,400,000 citations related to all aspects of agriculture covering 1970 to present.

"This Bibliography represents the culmination of over 70 years of work by many organizations and individuals. We would like to acknowledge the first librarian, Ethel L. Coon and, later, Julia S. Merrill and Alfred D. Straughan for compiling the original Bibliography. We would especially like to acknowledge the help of Hilary Burton, Janet Barclay, Shirley Freeland, David Knox, Albert Michael, and Hachiro Shimanuki for their help over the last 20 years in assimilating this online version."

In order to see how this bibliography works, I made several **searches** using key words. The following was

I have received several queries recently about how beekeepers might do their own library research on the World Wide Web. When replying, I realized that in fact this is the basic tenant of my **digital column** in **Bee Culture** magazine. Not only have I reviewed a **number** of comprehensive **web sites** over its history, but I have also described the use of discussion lists implemented as **e-mail**, availability of **full-text resources**, and existence of both **research** and **extension** sites dedicated to honey bees and beekeeping. Increasingly a number of bibliographies are making their way into cyberspace so that those wishing to look at more complete listings of references can do so. Thus, there are those dedicated to medicine at the **National Institute of Health** (NIH), **computer science**, and **others**. There is even a comprehensive listing of bibliographies at the **Library of Congress**.

Beekeepers too now have access to a rich bibliography of apicultural resources to do their own research thanks to efforts of many folks at the **Beltsville Bee Laboratory** over 75 years. The **URL** of this site is: <http://www.barc.usda.gov/psi/brl/Bibliography.htm>. According to the site:

"This unique Beekeeping Bibliography is of historical as well as current interest. This Bibliography contains summaries, abstracts, and citations to books, pamphlets, and periodicals relating to beekeeping covering the period 1905-1973 without interruption and is probably the oldest available in the English language.

"The Beekeeping Bibliography had its beginning in 1925 when James I. Hambleton, Chief, Division of Bee Culture, Bureau of Entomology, U.S. Department of Agriculture, brought together the books, pamphlets, and

displayed when prompted for information on American foulbrood:

Query: American Foulbrood  
Matching Record Count: 1920  
Total Retrieved: 25  
Interpreted Query: American Foulbrood  
Total Database Records: 30772  
Query Time: 12 seconds

Thus, the first screen showed 25 of 1920 records found in the bibliography using this particular search. It took 12 seconds, which also was time enough to find 30772 database records associated with an "Interpreted Query." This was a quite broad search, but there is the possibility of narrowing such down as one gains experience. The search also provided results based on a grading from 100 (most relevant) to 59 on this particular screen. Selected entries returned included:

Document Title: Comparative Susceptibility Of Larvae Of Different Stocks Of Honey Bees To American Foulbrood When Reared By The Same Nurse Bees.  
Match Number: 1 of 1920

Score: 100  
Filename: 12598.htm

Document Title: Resistance To American Foulbrood In Honey Bees.

Match Number: 2 of 1920  
Score: 100

Filename: 23588.htm  
Document Title: Les Insecticides Et La Loque Europeenne. (Insecticides And European Foulbrood.)

Match Number: 4 of 1920  
Score: 89

Filename: 27135.htm  
Document Title: Das Alter Von Faulbrutveränderungen. (The Age Of Foulbrood Modifications).

Match Number: 6 of 1920  
Score: 82

Filename: 25856.htm

Immediately it is noted that not only references in English are available, but also in other languages. Accessing the first entry above, the following information is returned:

AUTHOR: Hitchcock, J. D.


ARTICLE TITLE: Comparative Susceptibility Of Larvae Of Different Stocks Of Honey Bees To American Foulbrood When Reared By The Same Nurse Bees.  
JOURNAL TITLE: In: Tenth Internatl. Cong. Ent., Proc. Montreal, Aug. 17-25, 1956. 4:1097-1103, Tables, Fig., Refs

YEAR OF PUBLICATION: 1958

NOTES: Summary: In An Attempt To Determine If Different Stocks Of Honey Bees (*Apis mellifera* L.) Are More Resistant To American Foulbrood Than Other Stocks Because Of Differences Not Only In The Behavior Of Adult Bees But Possibly Also In The Physiological Resistance Of The Larvae Themselves, Larvae Of Different Stocks Were Reared In Adjacent Combs Simultaneously By The Same Nurse Bees. Larvae Were Individually Inoculated At The Same Susceptible Age. Removal Of Disease By Adult Bees After Sealing Was Prevented By Rearing The Sealed Brood In An Incubator. No Consistent Relationships Were Observed Between Larvae Of Different Hybrid Stocks And Their Susceptibility To American Foulbrood. The Percentage Of

January 2001

Diseased Brood Cells Within The Same Stock, Or Even The Same Colony, Were Extremely Variable. Larvae Of Different Stocks Frequently Showed Great Differences In Their Rate Of Development, But The Time Of Sealing Was Not A Reliable Index Of Their Comparative Susceptibility Of American Foulbrood. A Very Rapid Decrease In Susceptibility Occurred Between The Larval Ages Of 18 And 30 Hours. This Probably Explains The Wide Variations In The Percentage Of Diseased Cells Reported. These Experiments Appear To Substantiate Previous Literature Which Indicates That Colony Resistance To American Foulbrood Is Associated With Adult Behavior In Removing Disease, Rather Than With Physiological Resistance Of The Larvae.

Given the depth and inclusivity of the information one can find using this beekeeping bibliography, the possibility exists that any beekeeper no matter where he or she might be located now has as good access to library resources as almost any researcher. Beyond availability, however, comes another paradigm shift. No longer will it be acceptable for beekeepers to plead ignorance when making statements concerning honey bee biology. Increasingly, therefore, they too will be held to a high standard when making pronouncements as are researchers, something that can only be a good thing for all those interested in the biology of one of nature's most fascinating insects. 

Dr. Sanford is Extension Specialist in Apiculture, University of Florida. He publishes the APIS Newsletter: <http://www.ifas.ufl.edu/~mts/apishtm/apis.htm>



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Mark Winston



# Aganetha

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"I'll write about bees, and how scientist and artist alike have been fascinated by them."

**B**eing a registered scientist and all, I operate under the illusion that I'm objective. I believe that I see the world in a more fact-based, data-compelled fashion than a civilian might. That, of course, means considerably more than just how I relate to research results. The scientific mind-set is an entire syndrome, affecting how I read fictional books, decide what model of car to buy, and assess the relative merits of the various granolas I choose from on the grocery store shelves.

Because my mindset is so definitively science, I'm sometimes startled when I meet someone with a truly different brain. Especially artists; I am endlessly fascinated by the depths of imagination and the to-me eccentric perspectives that allow those of an artistic persuasion to create.

I encountered an artist last Fall who knocked my bee veil off, partly due to her having one of those unique and wonderful artistic brains, but also because of her unusual mode of artistic expression. She lives in Winnipeg, Manitoba, has become a prominent Canadian artist with numerous international shows and exhibitions to her credit, and she collaborates with bees.

Aganetha Dyck has been a practicing artist for much of her life, but in the last few years she has done her work inside of beehives. Collaboration is the right word, because she takes expressive drawings and ob-

jects, places them into hives, and allows the bees to build comb in and around them. The resultant objects are unlike anything you've ever seen before. They open up vistas of life as a bee, and even a seasoned beekeeper who has been into hives for decades will delight in her work..

I went to Aganetha's Winnipeg studio late one afternoon, after the totally different experience of addressing the Canadian Crop Protection Institute, whose members represent companies involved in producing pesticides and genetically modified crops. My mind was still focussed on pesticide policy and issues while I walked four flights up to her loft studio in a run-down old office building.

Not for long; as soon as Aganetha opened the door I felt a blast of her warm personality and artistic presence that jarred me from the facts of pesticides into a very different frame of mind. First impressions don't often fail me, and spending the rest of the afternoon with her only confirmed her deep and passionate involvement with bees and artistic expression.

She is not a beekeeper, and admits to continued caution around our insects. She cooperates with a local Winnipeg apiarist, renting hives from him in which she places all sorts of everyday objects and allows the bees to weave their waxy work around them, as well as original work that she has drawn or sculpted.

Aganetha began this productive partnership a decade or so ago, when she needed some beeswax for another project. A friend suggested she visit the Manitoba office of Bee Maid Honey to get the wax. She described her bee epiphany in an interview in the May 2000 issue of the art magazine *BorderCrossings*: *"I went to the bee place where farmers bring their wax, and above the manager's door was a sign that said Bee Maid Honey, and it was in honeycomb text about four inches deep. And I looked at it and I thought, now I've met the creatures I want to work with because they're sculptors. I noticed that beekeepers are really inventive people and they would try out all kind of things in the hive, and I was desperate to meet the man who made this sign. It took a long time. All of a sudden the manager called and told me Gary Hooper had made some signs for me like Gary Bee Art, Hi Aganetha, and Think Honey Art. So I phoned him immediately and he taught me what he knew about making texts in the hives."*

Aganetha has put everything from drawings to shoes to purses into colonies, but my personal favorite Dyck piece is her most well-known work, *The Glass Dress*, which has become part of the permanent collection of the Canadian National Gallery in Ottawa, Ontario. For this work, she put a wedding dress into a colony, and the bees built a marvelously intricate web of comb in and around the dress's folds. As a structure it's magnificent, but it also has

*Continued on Next Page*

another compelling quality, that of directing the viewer to see this common object in an entirely new way.

She currently is working on material for a new exhibit, to be held at the University of Manitoba, and has begun exploring communication between species in her bee art. This might sound odd. If I, for example, wanted to study that subject, I would design an experiment. Aganetha is going about it in a different way, by putting communicative objects into hives and letting the bees deal with them.

My favorite series in this exploration is her use of Braille, the raised-dot writing read by the blind. She became interested in Braille because it provides such a clear channel for communication, without conflicting images or sensory input to confuse the message. She has taken sheets of Braille, dabbed beeswax onto them, and then put them into hives. The bees, of course, cover them with wax and begin building comb, but the seemingly random patterns in which they deposit wax make for beautiful designs.

Not even Aganetha believes that the bees are reading the Braille and responding to its language, yet looking at the documents of bee art you can't help but think about Braille in a different way. We science types know that bees begin depositing wax almost randomly before picking some of the waxy sites to begin highly organized comb building from. The interspersed Braille dots and wax deposits elicit an appreciation for the way random can become organized, and excite the viewer to an intuitive feeling for how writing may have grown from haphazard patterns into true written language.

Besides her work, Aganetha is delightful to talk with because she takes so much pleasure in learning

about bees. For a recent birthday, she received a microscope which opened up closer vistas of bee anatomy to her. Artistic does not mean undisciplined, and her work ethic is exemplary. Every day, she does at least one drawing of a bee, now using the microscope to guide her hand.

Her current fascination is with legs, bee legs that is, and her careful and controlled pen and ink drawings of honey bee legs are marvelous contrasts to the more chaotic patterns of comb that the bees use those legs to build. She has begun putting the drawings into hives and letting the bees apply a light veneer

of wax before she removes them.

Aganetha then mounts the bee-modified drawings with subtle backlighting that amplifies the warm wax colors and intricate patterns created by the mingling of drawing and wax. It's tempting to think that the bees are commenting on her work, but of course we scientists




know better.

Another thing about Dyck that I enjoyed was her endless curiosity about anything to do with bees. We had a long chat about pheromones and communication, and I could almost tangibly feel her absorbing everything I told her from an artist's point of view. Her reaction was to begin speculating on how to use odor more in her art, to let the bees collaborate by using their smells as well as their physical work.

I left that afternoon carrying a strong feeling of her creative perspective with me, but also with a wonderful work of hers that she spontaneously and generously pushed me to take home. It's now mounted and in my sight as I write, continuing to amplify my own wonder and amazement at the multitude of ways bees and people interact.

My visit to Aganetha was not

without motive; I was asked to write the introduction to a brochure accompanying the new exhibit. I hadn't known what to write about, but talking with her inspired my direction. I'll write about bees, and how scientist and artist alike have been fascinated by them, scientists through wondering how the complex world of the honey bee functions, and artists inspired to make drawings and sculpture using bees to help express our human compulsion to create. That was her greatest gift to me, and one I will always treasure.

If you want to see more of her work, stop in to the DeLeon White Gallery in Toronto, Ontario. The gallery is moving to a Queen Street address, so call when you get to town (416-964-7838). I guarantee you'll never see bees in a coldly and limited scientific light again. 

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

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# DISEASE MANAGEMENT

## PART ONE

# IDENTIFICATION

Nicholas Calderone

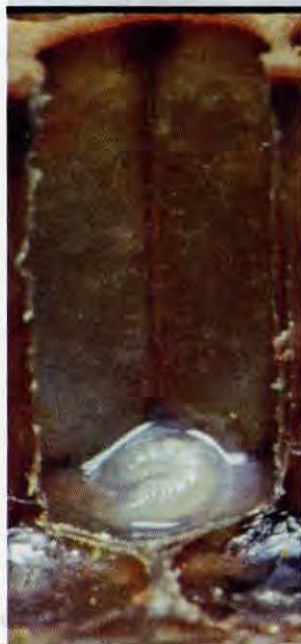
Like other animals, honey bees are susceptible to infection by a variety of organisms, including viruses, bacteria, fungi and parasites. Some organisms affect the adult bee, while others affect the brood, or immature stages. You will find that the diseases infecting the brood pose the greatest challenge to beekeeping. The most serious disease of immature honey bees is American foulbrood (AFB), a bacterial infection that infects the developing larvae. The serious nature of AFB is due to the fact that it is contagious and (if left unchecked) almost always fatal for individuals and colonies. The other major brood diseases are European foulbrood (EFB), chalkbrood (CB) and sacbrood virus (SBV).

Since the arrival of the *Varroa* mite, a number of other abnormal brood conditions have become increasingly common, especially during the end-stages of the mite infestation. The symptoms associated with these mite-related brood conditions are often similar to those of the better-known brood diseases, and this makes accurate disease diagnosis more difficult. Unfortunately, if you are not able to accurately identify brood diseases, you put all of your bees at risk. Additionally, ignorance can lead to the spread of disease to colonies belonging to other beekeepers. Therefore, it is essential that every beekeeper be able to identify the major brood diseases and know what steps to take if they are found.

An Integrated Pest Management Program is a desirable approach to disease management because it enables you to minimize or even eliminate the use of antibiotics in your management system. This has two highly desirable consequences. First, it reduces the likelihood that the pathogens will develop antibiotic resistance. Second, it reduces or eliminates antibiotic residues in your honey. This, in turn, allows you

greater access to the natural and organic foods markets and to the higher prices they offer at both producer and retail levels. An effective IPM program for disease management has three basic requirements: you must be able to accurately identify the major diseases, you must know what to do when you encounter a disease, and you must incorporate basic disease management protocols into your overall management scheme. So, let's examine these requirements, one at a time.

brown or tan in color, with a decidedly convex appearance. Combs with lots of scattered brood, combs with uncapped or partially capped cells, and combs with perforated, sunken cappings should always prompt a thorough inspection.



Healthy larva are a glistening white, almost shiny. (Jaycox photo)

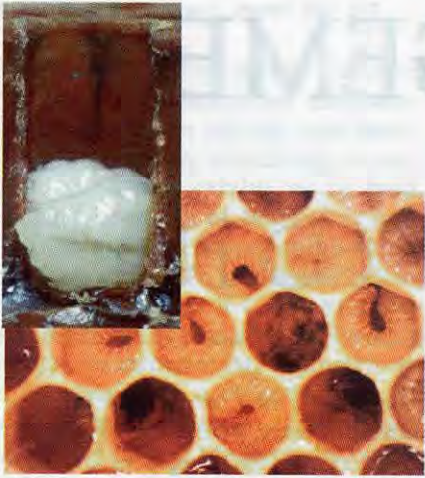


Learn to recognize a healthy, good brood pattern. Caps are convex, clean and completely sealed, with only a few or no uncapped cells.

The first step in disease identification is learning to recognize healthy brood. When conducting colony inspections, make use of the sun to illuminate the contents of the brood cells whenever possible. As you inspect the brood combs, pay close attention to the color of the larvae. Healthy larvae are glistening and pearly white. Larvae that are dull, off-white, yellow, brown or black may be diseased and merit closer inspection. You should also pay attention to the brood pattern. A healthy brood pattern has very few empty cells; and the cappings are uniformly

Discolored larvae and poor brood patterns may indicate the presence of a disease, or they may indicate a non-disease condition such as a failing queen, chilled brood or starvation. The diagnosis of a *disease versus non-disease condition* is often one of exclusion. In the end, you may not be sure what is causing the symptom; but you **absolutely** must be able to determine whether or not AFB is the cause of the symptom. In fact, one of the principal objectives of disease identification is simply to be able to accurately identify AFB.

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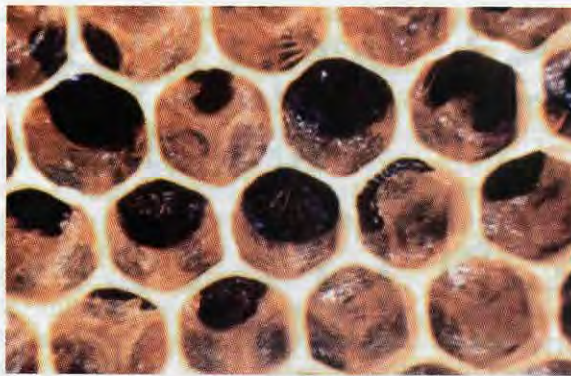


Note the pure white larva, compared to the tan/yellow larva that is infected with European Foulbrood. Side by side comparisons are best for learning. (Photos by Jaycox and Flottum.)

The more examples of abnormal brood conditions that you can observe, the better you will become at diagnosing their true cause.

**European Foulbrood** European Foulbrood is caused by the bacterium *Melissococcus pluton*. It is most common in the spring and to a lesser extent, in the fall, but can appear at anytime. Larvae become infected within one to two days after hatching from the egg when they consume brood food bearing the infective organism. Infected larvae first turn a light yellow, then brown. They usually die in the coiled stage and may be found lying flat in the cell or twisted up against the side of the cell wall. As the level of infection increases, the brood pattern becomes characterized by an increasing number of uncapped and partially capped cells. Capped cells may also contain infected larvae. The cappings are often concave or sunken into the surface of the comb. The infected larvae have a granular to watery consistency. The diseased larvae may rope out as much as two cm, but the rope is not elastic. Black, rubbery scales may be formed as the diseased individual dries out. These scales are relatively easy to remove from the cell.

Treatment with an approved antibiotic is therapeutic, but requires that you take the infected colony out of production in order to comply with label requirements. Requeening with a different stock of bees may also end the problem. The reason for



European Foulbrood eventually causes a complete melt down of the larvae, often in the coiled stage.

the effectiveness of this method is not entirely clear. It may be that most stocks are somewhat resistant to EFB; or, it may be that the break in the brood rearing that occurs with requeening enables the nest cleaning bees to remove the diseased larvae that would otherwise serve to perpetuate the infection. In either case, requeening is often effective.

**Chalkbrood** Chalkbrood is caused by a fungus, *Ascosphaera apis*. The fungus infects larvae three to four days after egg hatch and is most commonly found in worker and drone brood. Before you see the fungal growth, you may notice that an otherwise healthy-looking larva has lost its glistening sheen. The infected larva is quickly covered by a white, fibrous mycelium, which fills the entire cell. The fungal mass quickly dries to form a hard, shrunken mass called a mummy that is easily removed from cell. The shrunken head often remains visible as a light-brown protrusion. If different strains of the fungus invade a larva, they may form spore cysts, in which case the mummy will take on black and white mottling, or it may become entirely black. Mummies are often seen in large numbers at the entrance of a heavily infected colony. They may also be found in capped cells.

There are no approved medications for control of Chalkbrood. Fortunately, it is usually self-limiting; although some areas in the north-east are known to have serious prob-

lems with this disease. If you encounter a severe and persistent case of Chalkbrood in an area where the incidence of the disease is low, try requeening the colony to eliminate the condition.

**Sacbrood** Sacbrood is caused by a virus named sacbrood virus - SBV. Typically, there are a number of uncapped or partially uncapped cells throughout the brood nest. These cells contain

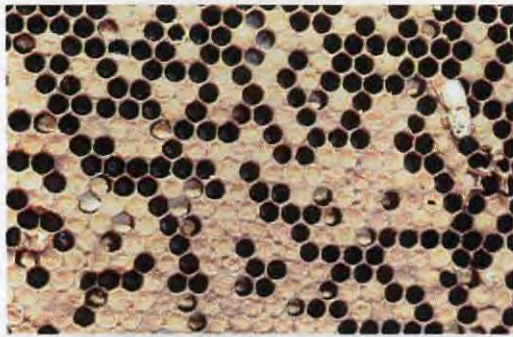
discolored larvae, usually gray to black, lying flat on the cell bottom with markedly darkened heads. The disease receives its name from the fact that the infected individual appears sac-like due to an accumulation of fluid between larval and pupal cuticles. If one exercises care,



The Chalkbrood fungus first consumes the larva, completely filling the cell with mycelia.



Once dried down, the 'mummies' are pulled out by the bees and disposed of outside the colony.



You may see the tan 'heads' of dead larva still in their cells with Chalkbrood.

the SBV infected bee can be easily removed intact from the cell with forceps. If you puncture the sac, the watery contents will run out. In more severe cases, you may find dark, brittle scales on the bottoms of the cells. These scales are easily removed from the cell. Like Chalkbrood, SBV is almost always self-limiting. There are no approved medications for control of SBV. If you have a persistent case of SBV, try requeening with a different stock of bees to eliminate the condition.

**American Foulbrood** American foulbrood (AFB) remains the most damaging of the honey bee diseases. AFB is caused by the spore-forming bacterium *Paenibacillus larvae* (previously known as *Bacillus larvae*). Larvae are infected within 72 hours of hatching from the egg by ingesting brood food contaminated with spores. The pathogen kills just about the time the cell is being

Active AFB is characterized by larvae or pupae that have melted down into a viscous pool of light to dark brown liquid lying flat on the cell bottom. During this stage, the rope test can be fairly informative. To conduct the rope test, carefully insert a flat wooden toothpick into the infected bee, gently stir three or four times, then slowly withdraw. If the diseased material can be pulled out of the cell two cm or more *the rope* - before snapping back in, AFB is most likely the cause. Unlike the EFB rope, the AFB rope *tends* to be more elastic. Unfortunately, a negative rope test does not always guarantee that AFB is not present, so test several cells. If you do not get a positive on the rope test, take a sample for laboratory identification. The presence of a smooth, light to chocolate brown pupa in the cell with its tongue adhering to the roof of the cell is not a common symptom, but is considered to be diag-

Unlike the other brood diseases, AFB will almost always go on to kill the colony. If other bees rob a weakened or dying colony infected with AFB, or if combs from an AFB colony are distributed to other colonies, the disease will spread. Therefore, it is critical that you take the right action when you identify it in your colonies. The best response to a case of active AFB is to destroy the colony using an approved pesticide and to burn the equipment, especially the frames, combs, wax and honey. Be sure to kill the colony when the bees are not flying. Check with your local fire department to determine burn-

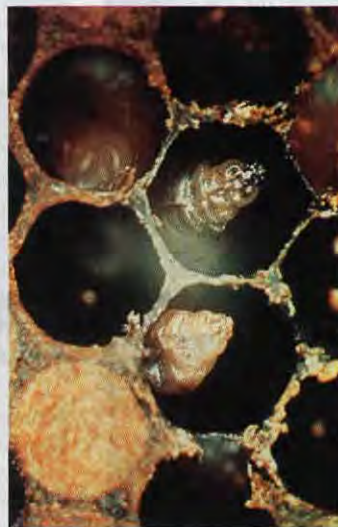


The AFB Rope test. The 'rope' will be elastic, sometimes. But not all AFB will rope. (Cornell photo.)

ing regulations in your area. You may save the hive bodies, bottom boards and outer covers if they are in good condition by scraping them clean with a sharp hive tool, then scorching all interior surfaces, including the narrow surfaces of the tops and bottoms of the hive bodies, to a depth of 1/16<sup>th</sup> inch with a weed burner or propane torch.

Use *Terramycin* only as a *preventative*. Generally, hobbyist beekeepers in states with good inspection programs do not need to use drugs for management of AFB. However, if you keep bees in an area where AFB is known to be a problem, you should use *Terramycin* (TM) as a prophylactic. That means treating healthy colonies with no evidence of disease. I recommend that you use TM as a dust or as a syrup additive in the spring. Follow the label directions. This means that you must treat your colonies so that the bees consume the entire dose of antibiotic at least 45 days prior to adding supers to your hives for marketable honey. Treat again in the fall after you remove your honey supers. This will protect your bees during the time when robbing is most likely to occur. Many

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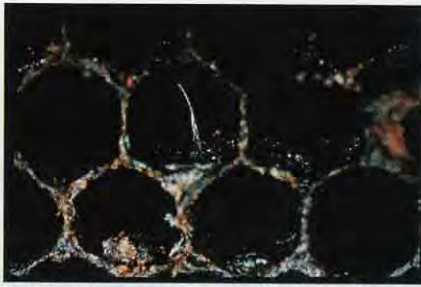


Two views of Sacbrood. Note the darkened head. (Cornell photos.)

capped, or shortly thereafter. As the disease progresses, the cappings become discolored and sunken, and the brood pattern becomes peppered with uncapped cells and cells with perforated cappings, all mixed in with healthy cells.

nostic for AFB. Eventually, the infected individual dries down to a black scale that adheres tightly to the bottom of the cell. The tongue may or may not be visible. A single scale may contain over 2.5 billion reproductive spores.

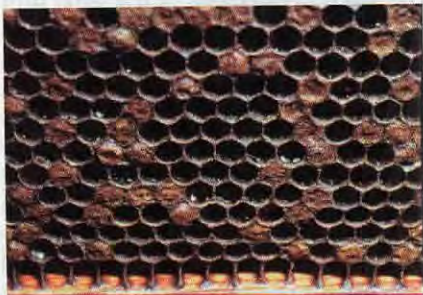




A dried down scale with the pupal tongue standing upright. Not all scales have this. (Cornell photo)

beekeepers use TM patties because they require less work. Unfortunately, the patties are often intentionally or unintentionally left on the colonies throughout the summer. This is a violation of the label and increases the chance that your honey will have antibiotic residues. If you use patties, you must comply with the 45-day rule *in the spring*.

Do not use antibiotic therapy on any colony with AFB scales or symptoms of active AFB. Antibiotics may alleviate AFB symptoms, but the disease persists in a latent phase in the form of highly resistant spores that remain viable for many decades. When antibiotic treatment is withdrawn, symptoms eventually reappear. In addition, if a colony with latent AFB becomes weakened as a result of some other condition, such as parasitic mites, bees from other colonies will likely rob it. The rob-



Numerous scales in a comb. This comb should be burned.

ber bees will likely carry the infection back to their colony. The lack of symptoms will also lull you into a false sense of security. Inevitably, you will move combs from the infected colony to healthy colonies, thereby spreading the problem.

**Parasitic Mite Syndrome** Parasitic mite syndrome is comprised of a number of symptoms, including, most notably, a pronounced pathology of the brood. Brood symptoms usually occur near the end of the



Proper placement of TM dust.

mite infestation and herald the approaching death of the colony. The brood symptoms associated with varroa infestation are believed to be a consequence of viral, and possibly bacterial pathogens, although brood may also die as a result of inadequate care stemming from the negative effects of mites on nurse bees. Brood symptoms are highly variable, and are often difficult to distinguish from EFB and AFB; however, treatment with terramycin (TM) does not eliminate this condition. A working diagnosis of parasitic mite syndrome can be made by eliminating other pathogens as the source of the symptoms and confirming the presence of varroa mites in the colony. If you find this brood condition early, treat with Apistan or Coumaphos. If you want to save the honey on the hive for human consumption, you

*Burning is sometimes the best, and only way to deal with an AFB infection. (Killion photo)*



must remove it before treating. If that is not an issue, you may leave it on the hive and use it as winter feed for the bees.

If you wait until parasitic mite syndrome is advanced, you will not be able to successfully treat your colony. You may kill the mites and eliminate the brood symptoms, but the remaining bees are likely to be damaged and unable to recover, especially in the fall, when healthy bees are needed for winter.

**Workshops** If you are a member of a beekeeping organization, get together with some of the more experienced members and organize a disease identification workshop. Encourage all of your members to attend, and publicize your workshops to non-member beekeepers in your area. If you are not a member of a bee organization, seek one out and take advantage of the opportunities they provide for you to become a better beekeeper. Remember! Disease



BPMS symptoms are difficult to interpret. Treating for mites usually helps, antibiotics don't. (USDA photo)

control efforts work best when everyone cooperates.

Identification and treatment are two-thirds of the solution to controlling brood diseases. Next time, we will look at a number of practices you can incorporate into your disease management program that will help reduce the chance of contracting or spreading brood diseases. **EC**

**Recommended readings:**

Shimanuki, H., D. A. Knox, B. Furgala, D. M. Caron, and J. L. Williams. 1992. *Diseases and Pests of Honey Bees*. In: *The Hive and the Honey Bee* (J. M. Graham editor). Dadant & Sons. Hamilton, IL.

*Honey Bee Pests, Predators and Diseases*, Third Edition, edited by Roger Morse and Kim Flottum. A.I. Root. Co. Medina, OH.



A box of slumgum and spent filter papers.

modified into solar wax melters. Other beekeepers have put their melters on pivot posts to have the melter always facing the sun.

Though solar wax melters are extremely cheap to use, they are inefficient. Probably only about 50% of the wax is recovered from a solar melter. Additionally, old hard combs are nearly impossible to melt in solar melters.

### Slumgum

Slumgum is that ugly residue that clings to the bottom of a rough-rendered cake of beeswax. It is made up of everything that is not honey and wax - though it does include a significant amount of wax. As it builds up inside the melter, it begins to form an insulating layer between the heat and the wax to be rendered. Melters require frequent cleaning - a messy job. Having a large content of cocoons and hive litter, the dark slumgum can be pressed under pressure in order to yield more wax, but pressing devices are rarely available to hobby beekeepers. Other than being an excellent fire starter for wintertime fires, slumgum has little use. Neither is it attractive to bees or wax moths. You can add it to your compost pile for next year's garden if you want.

ing material that bees do not produce unless it is needed. When a hive becomes packed with honey and nectar, returning field bees, loaded with nectar have no place to unload. During these times, even the house bees' internal storage structure (the crop) is filled with nectar. Bees that are of the right age, forced to hold surplus nectar, will involuntarily secrete wax. The beekeeper cannot make bees secrete wax short of feeding heavy sugar syrup.

At this point in the crowded hive, the bees do one of three things:

1. If the hive is not given extra space, they do nothing. So part of the honey crop is lost.
2. In early spring, crowded bees will swarm and again, part of the honey crop is lost.
3. The colony is given extra space, so it can build comb and continue to grow and store surplus honey.

Before the major flow starts, be sure to give colonies the space they need BEFORE they need it.

### Processing Beeswax

Melting down beeswax is an enjoyable process. Beeswax has a pleasant aroma. However, beeswax is highly flammable and can result in a quick, hot fire. In many commercial beekeeping operations, the wax rendering facility is a separate building from the main facility. Beeswax melts at 147°F and molten wax floats on water. Beekeepers having only a few hives can render a small

amount of wax in a double boiler where it can be ladled off and allowed to solidify into molded beeswax cakes. For larger operations, there are many models of melting devices that can be used to melt beeswax. Though most of these devices require hot water to accomplish wax rendering, some wax melters use hot air as the heat source. Wax is extremely durable and stable but will readily absorb residues from surrounding chemical sources.

A popular melting device for the hobby beekeeper is the solar wax melter. It is primarily a box, painted black on the outside and white on the inside with a glass covering. The box is normally tilted in order for melted wax to run out into a collection pan. Many times, discarded refrigerators with the door replaced with a double glass cover have been

### Beeswax Candles

In years past, the production of beeswax candles was a prominent reason for keeping bees. Even today, beeswax candles are high quality candles that are nearly smokeless and dripless. Candles can be either

Beeswax candles from molds.



poured or dipped. Poured candles are generally smoother, but may not have the character that hand-dipped candles have. Though still available as new devices, antique candle-pouring molds are frequently seen in antique shops and are expensive. Candle making is an aspect of beekeeping that many people do without ever owning a hive.

**The Candle Wick** Clearly, a wick is required for a candle to burn. The wick absorbs the wax in a liquid form and burns the molten beeswax absorbed by the wick. Too large a wick and the candle sides burn out from excessive heat, while too small a wick results in a hole burning down



A shop built jig for dipping eight candles at once.

the center of the candle until the flame is extinguished. All wicking today is braided. When burned, braided wicking curls to one side and does not require frequent trimming (snuffing). Wicking can be purchased from candle supply stores or from craft shops. Specify the diameter candle to be made when you purchase wicking. Some experimentation will be required before you find the exact right wick for each of the candle types you make.

#### Hand-Dipped Beeswax Candles

Always remember that beeswax is highly flammable. When making simple hand-dipped candles, liquefy enough beeswax to yield the length of candle desired in a non-ferrous



Pouring molded Christmas ornaments.


container. Attach a weight to the end of the wicking and dip the weighted wick into the molten wax to the depth desired. Pull the wick from the molten wax and wait a few seconds for the hot wax to solidify. Then dip and wait until the desired-size candle is produced. This procedure does not guarantee a perfect candle, but a functional candle will be dipped.

**Poured Candles** Depending on the mold, either tin or rubber, thread the wicking through the mold and pour the molten wax into the mold. Craft stores sell a candle release compound so the wax will not stick to the mold. After thoroughly cooling, open the mold and remove the candles. In many cases, poured candles will be attached by the wicking and will require cutting the wick in order to get two separate candles.

#### Beeswax Foundation Candles

Beeswax foundation, as is used in frames, can be rolled around a wick to produce a beeswax candle. This candle will burn more quickly than either a hand-dipped or poured candle but does not require any heat or molten wax. Candle sheets come in a variety of colors and are easy to make.

#### The End of the Year

Finishing the wax crop and pouring a few candles really is the end of the past beekeeping year. Life in the hive goes on. Next year will be more of the same, but with continual improvements. Next year, healthier bees, more honey, fewer swarms, and more stories. I'm planning already. 

Dr. James E. Tew, State Spec., Beekeeping, The OH State University, Wooster, Ohio 44691, 330.263.3684, Tew.1@osu.edu

# MURDER

# MOST FOWL

Julie Sobchack

It is my habit on Summer afternoons, when I have the time, to take afternoon tea with my bees. At four o'clock, cup in hand, I wend my way through the garden toward the hive, pulling the occasional weed, snipping off a dead head or two. I had missed the lovely ritual for some days, however, busy with too many other things that occupy a gardener this time of year. So I was looking forward to spending a quiet hour with "the girls," when I saw him, eye fixed firmly on his prize. His sharpened weapon glistened in the sunshine.

His behavior was shocking. He took me completely by surprise, and I had witnessed several murders before I understood what he was up to. How long had he practiced this craft to get so good at it? I shudder to think how many joyful innocents fell victim to his heinous acts.

I couldn't believe this was the same one we'd fed all Winter, his cousins, too, with unshelled peanuts. But if I stop to think of it, his dark habits where other birds' eggs and young are concerned is no secret. I just had no idea his rapacity extended to bees.

"He" is a *blue jay*.

One of the varieties of jays found here in the Great Basin is the scrub jay (*Aphelocoma coerulescens*). Like all jays, scrub jays are cheeky and loud, they are nest-robbers, clowns and great insect eaters. On cold Winter days, they are robin-sized amusement on the wing. Scrub jays of both genders have no crests on their heads, but they possess the most beautiful blue wings and long blue tails and love to hang out in scrub oak, pinyon-juniper stands, chapparal and, according to the bird book, the suburbs. Nowhere in that book did it say anything about jays hanging out at bee hives. Surely this must be an aberation, I thought, a one-time occurrence.

The next afternoon, tea forgotten, I watched, hidden behind the butterfly bush. At four on the nose, here he came, floating silently into the apple tree behind

the hive, waiting for the new bees to come out and dance in the air, orienting themselves to their hive. Gone was his usual raucous, mocking call, or the *Shraap! Shraap!* of his "I want a peanut. Now!" cry. This time he was on 'silent running,' and his wings made hardly a whisper as he floated to the ground near the bottomboard, head cocked, beady eyes bright and black.

The new bees didn't stand a chance when they began their afternoon social. *Zing!* A gray-blue blur, he grabbed a bee in his beak, beat it against the ground a couple of times and swallowed it. The next one was taken just as fast. It took my breath, this rapidity of death. I left my cover and walked boldly toward the hive, but he took no notice, so intent was he upon his killing and feasting. When I spoke to him, he ruffled his feathers, and I swear he muttered something dark. But he held his ground. I stepped closer. With a squawk, he flew up into the lower branches of the tree, waiting for me to leave. When I didn't, he flew into the tree on the other side of the fence and watched me, patient as could be. I told him I didn't appreciate him eating my bees, but he just laughed, unafraid. I flapped my arms at him and he flew off, but I could tell he was smirking.

As soon as I turned

away, he flew back to the hive.

Shortly after that, Tom came home, and I told him about the blue jay adventure, but he had to see for himself. Blue Bee Eater was still busy; his killing sprees seemed to last an hour or so, until he'd had his fill. Even though we know how clever the jays are and love them for it, we just couldn't believe the capacity for organization this bird was showing us. Regular, like a well-oiled watch, every day, and he always knew to go toward the left-hand side of the hive entrance the bees seem to prefer this Summer. He never missed by a minute his arrival, never missed what he aimed for with that long, black beak.



Continued on Next Page


"That guy is eating a lot of bees," Tom said, astonished at the numbers that went down the blue-feathered gullet. "What can we do?" I asked. "Let me think about it for a minute," he answered.

What he came up with is sort of a squareish, three-sided tunnel of chicken wire (I'm told the proper term at local hardware stores is 'poultry netting'), closed at one end, that we placed over the hive entrance. It took the bees a day or two to figure out how to navigate this strange contraption, and when we didn't see the jay for those couple of days, we thought we were home free. But our clever killer had other plans.

The very next day, Blue Bee Eater came back. He sat in the tree and looked up and down, reconnoitering. He perched on the top of the hive, eyeing the returning forager bees. He flew onto the cage, but didn't like the feel of it on his feet. He flew into the tree and yelled at us. "Fooled you," we called back, but it wasn't four o'clock yet.

The new bees appeared right on schedule as they

had most days, dancing up and down in front of the hive like swirls of bubbles in a glass of champagne. Right after that, Blue Bee Eater fluttered silently to the ground near the wire cage. He watched the rising, circling bees for a moment and then, bold as brass, he hopped up to the left side of the hive and picked one off. Right through the wire! It was harder for him to reach in, and we may not have stopped Blue Bee Eater, but we slowed him down some.

We are very conscientious, some have said obsessive, about our care for the bees, considering we have only one hive. We are meticulous with medications; we always put a mouse guard in the entrance when we winterize the hive, and are ready with other remedies should the local raccoons and skunks discover the bounty of bees in our garden. But no one ever warned us about the blue menace that drops from the sky, bringing death and destruction to the unwary. *And laughs about it!* 

*Julie Sobchack is a hobby beekeeper, blue jay foiler and freelance writer from Salt Lake City, UT.*

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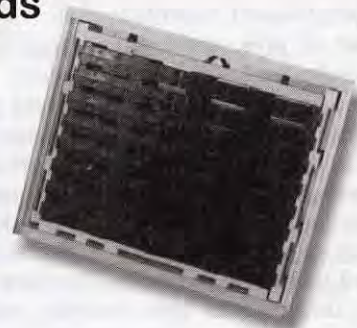
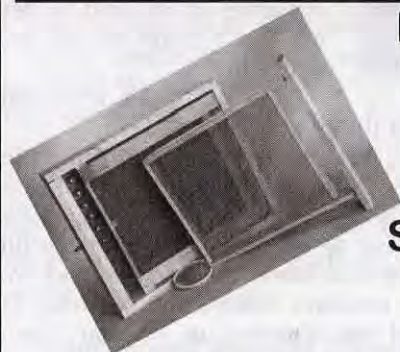
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# The PACKAGE CHRONICLES

Richard Dalby

*Experience is a good teacher. But learning from others is more efficient. This is the first of several lessons you can learn from someone else's errors.*

At various times over the course of the Winter of '99, my friend Bill and I talked about getting some package bees come April. Like many another beekeeper, I had learned the hard way about the infamous *Varroa* mite. In September of 1998, in the space of three weeks, I lost 21 colonies. It was not a happy experience. By that following Summer I was down to just five colonies left. I hardly considered myself a proper beekeeper anymore. All five hives made it through the Winter, and I considered splitting them, but only one seemed strong enough to do so.

So there I was, with plenty of empty hives, lids, frames, and all the rest. All I needed was bees. Lots of them.

Bill, not a hive owner himself but my helper over the years, finally talked me into it. We would get 10 packages of bees this Spring to partially restock my apiary. Bill may have had an ulterior motive in all of this, since he is particularly fond of honey. At any rate, we laid our plans. It was mid-March. Could we even get any package bees at this late date? Bill called Jones Bee Company in Salt Lake City. They would be trucking in a load of package bees from California as in former years. Reservations must be made by the end of March, with the bees to arrive in Salt Lake on April 5<sup>th</sup>.

Now the big question. How many packages to order? I was in a con-

servative mood. Five seemed enough to me. Bill is an optimist. He could see a large honey crop. Why not order 15? So what if the wholesale price of honey resembles the lunar landscape. We won't sell our honey crop wholesale. We can put some of it in gift packs for Christmas. We can sell the rest at retail.

Bill paints an appealing picture. Okay, I say, let's get 10 packages. That should be fine for this year. Bill agrees. Ten it will be. So now I have about a month to get things squared around before the package bees arrive. But, as noted, I have plenty of beeless hives, some of them still sitting out in the yard right where they were when the blankety-blank mites got them. All I need to do is tear into them, find some good worker comb, fix those

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***"In the textbooks, all beekeeping tasks proceed smoothly and efficiently. In the real world, sometimes they do and sometimes they don't."***

---

hives and lids in need or repair, and generally get everything ready for the arrival of those 10 packages of *bees*.

It's now a month later, two weeks into April. The preparation work I was going to do remains, for the most part, undone. I have been busy doing other things that needed doing. At any rate, how long can it take to get 10 hives fitted out for new occupants? Nothing to it. Piece of cake.

April 15<sup>th</sup>, a Saturday, arrives. Bill, who was to go to Salt Lake and get the 10 packages of bees, does not arrive here with them. I call his place. (Bill lives in the next and larger town, 11 miles north of Levan.) It is about 9:00 in the evening. No answer. Well, I surmise, he probably got a late start and had to go here and there on the way home. He'll show up with the bees tomorrow.

Sunday evening. No Bill. No bees. I call again. Bill is there. He had to go to a niece's wedding Saturday afternoon out of town. Jones Bee is closed Sunday. He'll head to the city tomorrow (Monday) to pick up the bees. Well, that clears that up, anyway. I'm sure the folks at Jones Bee will take good care of those 10 precious packages until Bill gets there.

Next day, April 17<sup>th</sup>, along toward sundown, Bill pulls up in his old '67

Chevy pickup truck, its once red paint weathered to orange. That truck is one of the wonders of the modern world. It has been places that a truck, even a 4-wheel drive truck, ought logically never go. You see, Bill is, among his many other attainments, a prospector, and when the road out in the hills comes to an end, Bill must sometimes drive to some other road on his maps over rugged terrain. But that's another story. Back to the bees.

I'm down at the apiary, near the old house. The few colonies I have left are out back. I walk over and open the gate. Bill pulls in. Does he have the package bees? Yes, he says and opens the camper shell which covers the bed of the truck. And there are the bees, at last. It's been a long time since I had anything to do with package bees and they make a wonderful sight. For easier handling and to make certain proper ventilation is maintained during shipping, the packages are lathed together in bunches of five packages, with about three inches between the wire-screen sides of the adjacent packages. Two strips of lath are stapled to the tops of the packages with long staples from a staple gun.

As Bill gives me a narrative of the day's events, we check out the packages. Now I notice there are two extra packages sitting singly, one on top the other. Seems Bill decided to get a couple extra, just for good measure. Great. The more bees the better. Isn't that standard beekeeping logic, after all? I heft one of the single packages. They're heavier than I remember. Bill reminds me that these are 2½ lb. packages, not the standard two-pounders. All the better. The package bees appear to be in great shape, with few dead bees on the floor of the packages. The bees themselves look almost golden in the light of the late afternoon sun. It is starting to get a bit chilly, and the bees are clustered like tiny swarms inside their temporary quarters. With the packages sitting on the open tailgate, I lift each feeder can containing sugar syrup just enough to find out about how much feed each package has left. All the cans are heavy, except one. I

must remember to hive that package first, as their food supply is almost gone.

The main order of business, now, with night coming on, is to find a good place to put the packages until they are hived. The ideal place is close at hand, on the workbench in my honey house, which is right next to the truck. The packages should be fine there. Excessive heat is the enemy of package bees, much more than cold is. It is cool in the honey house, but not cold, and the light is subdued, all of which is to the good. Bright light and excessive heat are to be avoided if possible. You want the bees to remain until hived in a state of quietude.

Bill and I carry the package bees into the honey house and stack them neatly on the bench. There. There they sit all full of promise. It's a beautiful sight. At least to a beekeeper. The weather, which has been unseasonably warm for the last two weeks, couldn't be better for starting hives from packages. There are yellow expanses of dandelions everywhere right now, and the apple tree near the gate is full of blossoms. We're supposed to have two more days of warmer than normal temperatures. If all goes as planned (it's not going to), I'll have those 12 packages of golden Italian bees all hived two days from now. The bees are humming contentedly as Bill and I head for home. I



feel like a beekeeper again. I think they call what I feel *elation*.

In the textbooks, all beekeeping tasks proceed smoothly and efficiently. In the real world, sometimes they do and sometimes they don't. I had planned to get those 12 packages of bees hived in two days, working in the afternoons, after attending to the daily routine. It was a good plan, in the abstract. Unfortunately, I had not gotten around to preparing 12 hives before the bees showed up. Getting those hives ready

took much longer than I had anticipated. For starters, coming up with some good worker comb was not as easy as I had hoped. A mouse had effectively destroyed about half the comb in a three-box deadout, despite the 'mouseproof' entrance. Wax moths had done their delightful thing here and there in other mite-killed colonies from last September. Good lids and bottomboards seemed suddenly in short supply. Hives, particularly the frame rests, needed scraping. Some hives needed some field repairs. Frames needed propolis removed from the self-spacers. Much of the time available was spent doing such things. The net result was that I managed to get only one hive ready to use that first afternoon before darkness shut the operation down. By the way, did I mention the fun I had trying to locate enough burlap to make inner covers (I don't use those bee supply catalog inner covers, but that's another story).

Okay. Hive's finally ready. It's almost dark. I go to the honey house and get a package of bees. It's only about 50° now outside so they're not very rambunctious, which is all to the good. I decide not to light the smoker, though I do slip on a veil. There's the hive. Remove the feeder can. Shake bees adhering thereto into waiting hive. Grab metal strip and slide queen cage out of package. Place queen cage temporarily aside. Invert shipping cage and shake majority of bees into hive. Take cork out of candy end of queen cage and suspend cage between . . . What? The queen cage has no candy in it, just a cork in the single opening. How do you introduce a queen in this kind of cage? Decision time. Do I leave the queen caged and then release her myself in a day or two, or do I release her now? After all, she's been with these bees for days. Surely they know her by now. And wouldn't

*Continued on Next Page*

it be better to release her now when the bees are in a temporary state of confusion. I should have read up on this. Well, old girl, you're going in, which means you're coming out of that little queen cage right now.

I remove the cork, hold the cage opening (bees generally crawl upward) between two parted frames. It's almost too dark to see her. The bees have started that familiar 'come hither' homing call. Okay, girl, come on out of there. Why didn't I bring a flashlight? She must be out by now. There's something crawling around on my index finger. Probably a worker bee. Surely it wouldn't be the queen. Best take a closer look. No! It is her, looking half chilled. Careful. If she drops off into the grass I'll never find her. Down she goes, clinging to my finger, into the middle of a dark mass of bees. I expect to get stung. But, hey, anything for the queen. Right? I slowly remove my finger. She's gone, off amidst that humming mass. Or so I hope. At any rate she's no longer on my finger. I close up the hive, feeling to make certain the lid's on right. Wait a minute. What about this shipping cage, which still has quite a few bees in it? Off comes the hive lid. In goes the shipping cage (at this point there are only six frames in the hive, which leaves room for the cage; the bees left in the cage will make their way out and over to the frames to join the other bees).

I carefully replace the burlap cover and the hive lid. That's that. The bees are hived. It wasn't a textbook perfect way to do it, but it's done. The

bees were gentle as gentle. Probably happy, in their own bee way, to be out of that cage and into a proper home. The books speak of package bees sometimes absconding, particularly when hived on foundation. But I am using drawn comb, which gives the bees immediate storage and bee-rearing room. And, hived

this late, they have no choice but to stay the night. Odds are that by morning these bees will consider this hive their home. I just hope I did the right thing releasing the queen immediately. Well, it's done. One down and 11 more packages to go. I walk home rather happy. None of the bee books mentions just how satisfying hiving a package of bees can be.

I'd like to say that I got the 11 remaining packages of bees hived the next afternoon, but I didn't. It took me four more of those late-afternoon into evening sessions to finish the job. Prior preparation would have helped things greatly, but other tasks seemed more pressing. After losing most of my hives to *Varroa* mites while attempting to develop a resistant strain of bees, I had become somewhat disenchanted with beekeeping. Until those package bees showed up, I wasn't very eager to get back into the fray. What I did want to do was find a way to eliminate every bleeping parasitic mite from the known universe. But having bees again in those formerly empty hives changed everything. Hearing the buzz of busy bees brightened the world. And with new miticides now available, no mite was going to put me out of the bee business again.

As the hiving progressed I became more efficient at it. One afternoon

in the time available I hived five packages. It was wonderful fun. I soon took to releasing the queens by removing the screen wire from their diminutive cages with a pocketknife. I soon learned to shake the bees into the empty space in the hive, rather than on top of the frames where they were slow to migrate downward. It even dawned on me to pop the plastic insert out of the feeder can and shake the remaining sugar syrup into a frame to feed the bees. I was greatly pleased with that idea, though I'm certain it was not original with me. As I hived the last two packages on April 23<sup>rd</sup>, it was almost dark. A large cloud loomed in the western sky. The forecast was for rain later in the night and on into the next day. At last all 12 packages are hived. Wonderful. I was back in the bee business.

**April 26<sup>th</sup>** - I walk to the apiary in late afternoon to remove shipping cages from hives. About this time Bill shows up to check his sheep, which are in a pasture across the fence. The package bees are still flying though it is almost sundown and growing slightly chilly. Bill and I check several hives from the outside. The bees are bringing in pollen, a cheering sight. Without lighting the smoker, I carefully open a hive and remove the shipping cage.

Nary a bee objects. I do the same with another hive, with the same result. Well, as far as gentleness is concerned, these bees pass the test. Bill, kneeling near the entrance of another hive, sees an incoming bee pause at the hive entrance to do a dance before going inside. As Bill and I stand watching the sheep grazing across the fence in the pasture, we discuss the dance-language hypothesis and the controversy it sometimes engenders. Both of us conclude that the scent-only theory is rather implausible. We put the empty shipping cages in the honey house, pending their return to Jones Bee Company for a \$2.00 per cage refund. Do they want the feeder cans back as well as the cages? We decide to take the cans back too, just to be on the safe side.





**April 27<sup>th</sup>** - A beautiful Spring day with the temperature up to near 80° in the afternoon. There are all sorts of blossoms available right now for the package bees, including apple, cherry, and expanses of golden dandelions. In the afternoon I go to the apiary to remove the last of the shipping cages and do a spot check to see how the bees are doing. Though I light my smoker, it is probably not necessary. The first hive I check has begun building comb (just little projections attached to the burlap inner cover) so I must add several more frames to each package hive as soon as possible. Bees don't wait, at least in Spring. I check for a laying queen, still not knowing for certain if my queen introduction method worked. What a beautiful sight. Brood in three frames and lots of new honey. I check another hive. The same story. Three frames of brood with new honey. There's the queen, large and golden. The bees and queen are very calm on the frame. As I watch, the queen, seemingly oblivious to my intrusion, backs with great stateliness into an empty cell and deposits an egg. What a grand sight to see! I carefully replace the frame and check a third hive. It, too, looks to be doing great. Who gets the credit, me or the bees? I think they get most of it. **BC**

*Richard Dalby is a sideline beekeeper and freelance writer living in Levan, UT.*

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# TIME

## Is Money

Save Some Of Both This Year

Ann Harman



It's January. The holidays are over. Your bees are resting and your New Year's Resolutions are still fresh and unused. Let us hope you resolved not to join the Procrastinator's Club this year. This month we are going to take a look at both the past, the present, and the future. If you live in a mild climate, bundle up and go out to your bee house and storage shed. If you live in a cold climate bundle up even warmer and do the same. Take a clipboard, paper and pencil. All you are going to do at the moment is write down everything you have in bee equipment - for example how many honey supers and what size (shallow? deep? half-depth?); extractor (hand-cranked?, how many frames?); settling tank (what capacity? other features?); and anything and everything else that you have for your honey and wax processing. Please don't forget things like hand carts, barrel trucks, uncapping equipment, pumps, and heaters for crystallized honey. Be certain to note down the pieces of equipment that annoy you for whatever reason. Surely there is something that you would like to throw over a cliff. Now you have the start of a project that will occupy some of your time between watching television and watching snowflakes. You are going to assess your current honey and wax processing status. Perhaps you have been planning to buy a bigger extractor. Maybe you have decided that duct tape isn't such a permanent repair for that pipe or tubing. The equipment catalogs will soon be arriving - what items will tempt you? What items can you not live without? Is there something you have been threatening to buy for a long time but are afraid it is not practical or affordable?

Benjamin Franklin gave us an important phrase when he wrote Advice to a Young Tradesman in 1748. "Remember that time is money." What value do you put on your time? Or are you like many beekeepers who laugh when asked that question. You need to put a value on your time. Decide on something reasonable and write it down. Right now we are considering honey and wax processing, not time spent in the apiary or taking bees for pollination. With a value put on your time we can then consider whether your processing equipment is suitable and whether a purchase of a different piece of equipment is economically practical.

Be realistic with your thinking through this project. Remember, it's January and unless you are in almond pollination you should have some time to think.

Now that you have your list of equipment, arrange it into a flow chart. That chart should start at the hive with removal of supers and finish up with your final product, whether it is drums, 60s, or bottled and labeled. You can now sit in your easy chair and mentally go through the steps from bee to final product. Remember in all of this analysis, equipment can be bought secondhand in good condition. Equipment can also be sold. Someone is always going out of business, moving, even downsizing or upsizing. Just because a piece of equipment is inefficient for one beekeeper does not make it inefficient for someone else.

Let's start at the hive. Think about chasing the bees out of the supers. Does your way seem time-consuming? Have you considered any other way, such as a bee blower, but shelved that idea as too expensive? Perhaps you could borrow a blower next summer just to compare the time spent removing bees with your method and with a blower. Now that your time has been given a value, you can calculate whether you actually save money by making a purchase. We can also look "backwards" to see if the blower you purchased last year really saved you time and effort.

Time to take the supers from the hives to the honey house (mentally). Here is where you really need to consider "time is money." If you are fortunate, you have already devised an efficient way to do this. But if not, are you stuck in a rut of moving heavy, sticky supers one-by-one and then moaning about a backache later? Since you are sitting comfortably in a chair at this time, what would be your dream machine of getting those supers to where they are needed? Four wheels and some 2X4s make a dolly the dimensions of a super. Make several - they're cheap. Supers can be stored on dollies. Storage can then be organized by type of super. Perhaps you use deeps for some, comb honey sizes for others, and a mixture of Illinois and shallows. With dollies you can make efficient use of your storage space by putting the stacks close together. Now you can spin one stack out of the way of others to retrieve the size

Continued on Next Page

you want. So consider moving supers to be not only from the hives but also after extracting and for storage.

Uncapping has lots of possibilities. Every beekeeper, large or small, wants a quick, easy way. Usually a look at prices of uncappers causes a change of mind and a return to the old way. Use your count of how many supers you uncap; an average number will do. You might be paying a helper at this point (or you might have persuaded a family member to help for free). Work out the hours and cost of your time, including paid help if appropriate. Now take another look at the price of various sizes and types of uncappers. One of those may prove to be more economical than a helper, and uncappers don't take coffee breaks.

Take a good look at your extractor to see if the number of frames it holds is suitable for the size of your operation. Now aren't you glad you counted those supers. You have needed that information already. Is the size of your extractor, and the type, the bottleneck in your operation? If it is, determine what the problem is. Perhaps it does not hold enough frames. Perhaps it is manually operated. If the problem is not holding enough frames, estimate what size extractor would be the best for your operation. Remember when considering the purchase price of a different extractor, you can sell the one you have. Extractors, unless really antiquated or abused, do not lose much value over the years. They are not like new cars with ever-increasing new gadgets and cup-holders.

From extractor to settling tank to the next step, whether drums, 60s or jars. How smoothly does that go? Perhaps a rearrangement of the honey house would help. In your mind, or on paper, you can push equipment around so that you are not tripping over something or bumping into something or moving something else to do what has to be done. Think "up." Would a simple platform solve some annoying situation? While you are thinking arrangement, consider the time you spend in cleaning up the honey house. Cleaning up is always a boring but essential job. Why not make it as easy as possible.

Consider where you store empty and filled drums, empty and filled 60s, and empty and filled jars. Empty containers always seem to occupy an incredible amount of space. But filled containers because of their weight need to be considered first. They should be easy to move out from the honey house to their final destination. When rearranging honey house equipment you will need to put those containers in an efficient space. Maybe a solution to honey house arrangement is more than one door – one for supers coming in and one for containers to go out. Another door may be an economical approach.

Suppose you bottle and label. This area needs to be comfortable for you. Give some thought to how often you stop "to rest your back." If frequently, then something is wrong with your arrangement. Change the height of something even if it means sawing off the legs of a chair. Small automatic bottlers can be really economically efficient since they free up some of your time. Consider their cost as money well spent.

Before you think all new equipment is being called for, let me remind you that basically you are looking for the worst bottleneck in your operation. Certainly rearranging a honey house before the season starts does not cost anything. Some solutions cost little but have big gains in time and convenience. If you have put a fair value on your time, you can decide whether just one piece of different equipment is justified this year. It may well be. There is no point in continuing to grumble

about something that is slowing down your operation. Manufacturing companies spend much money hiring people just to study efficiency in the operation. The manufacturers realize that a few pennies saved mean the customer is pleased with a lower price.

*"Be realistic with your thinking through this project. Remember, it's January and unless you are pollinating almonds you should have some time to think."*



We have just one more item to consider ... the cappings wax plus other wax you have accumulated. If you are stumbling over bags and buckets of cappings wax, that is not really efficient. Even if you consider wax to be a byproduct of your honey operation, it represents an income. Granted, the price of wax goes up and down, just like the price of honey. But it still has value, especially if it is clean cappings wax. You can decide whether you want to use it yourself, say for candles, ornaments or a wax account for foundation, or whether you just want to sell it. But do something with it.

When you are considering the arrangement of your honey house, you must consider wax processing. It is possible to have this as a second "production line," separate and not interfering with honey processing. Find a piece of equipment that fits your needs. That equipment will indeed pay for itself in the near future.

Organizations and manufacturers are encouraged to have plans not only for the near future but also for the next 5 years, or longer. Think back to see if you had a plan 5 years ago that considered your honey operation of today. So often honey processing "just grows" without any planning.

So go and bake some honey cookies, fix a cup of tea with honey and attack – on paper – your honey house, processing and your 5-year plan. You may be surprised to see that the one piece of equipment you've been dreaming about becomes a reality this year. **EC**

*Ann Harman is a sideline beekeeper and international marketing consultant.*

# ?Do You Know? Answers

1. **True** Eva Crane was the original director of the Bee Research Association. Under her leadership the Bee Research Association became International in scope, thus the IBRA.
2. **False** Midnites are produced from a four-way cross of caucasian inbred lines. These hybrid bees have a gray-black appearance and are extremely gentle. Due to its caucasian origin, excessive propolization is their biggest disadvantage.
3. **True** Rev. L. L. Langstroth is known as the Father of American Beekeeping, credited with the discovery of "Bee Space" and invented the first practical movable-frame hive in 1851.
4. **False** The dark or Black German Bees, not Italians, were the original race of honey bees brought over by the colonists.
5. **False** Steve Taber III developed forceps for transferring honey bee eggs.
6. **True** Johannes Dzierzon advanced the theory of parthenogenesis in the honey bee drone caste, development from unfertilized eggs.
7. **False** Franz von Hruschka, of Austria, invented the first method of extracting honey from the comb, by centrifugal force.
8. **False** Frank Benton developed the queen- mailing cage.
9. **True** In 1791 Francois Huber determined that queens could be reared from very young worker larvae by transferring them to queen cells. He may have been the first to use this system of "grafting" larvae, so commonly used in queen production today.
10. E) Spain
11. B) Jonathan W. White Jr.
12. B) American Honey Plants
13. A) G. H. (Bud) Cale Jr.
14. D) Crop Pollination
15. Skeps
16. G) G. M. Doolittle
17. E) C. C. Miller
18. I) R. E. Snodgrass
19. K) Karl von Frisch
20. J) Dorothy Hodges

21. D) H. H. Laidlaw Jr.
22. D) H. H. Laidlaw Jr.
23. F) Eva Crane
24. L) A.I. Root
25. H) Carl E. Killion

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

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

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



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# Hygienic History

## PART I

Steve Taber

In the last several years many articles in this and other journals have appeared concerning hygienic bees (HYG). Several queen breeders now include in their advertisements, that they are selecting for this characteristic in their queens. Essentially, this genetic characteristic measures the speed that bees remove dead, sealed brood from the brood nest. Those bees that take 48 hours or less to remove a certain number of dead bees are termed HYG. Bees that take longer than 48 hours are termed non-HYG. This series of articles is going to explain exactly what this characteristic is, why it is important, and how you as a beekeeper can get it in your bees.

Some of you with long memories may remember that this is not a new concept, dating back to the mid 1930s. So I shall begin this series then and show how this concept has been developed, over time, by many different people all working toward

similar objectives.

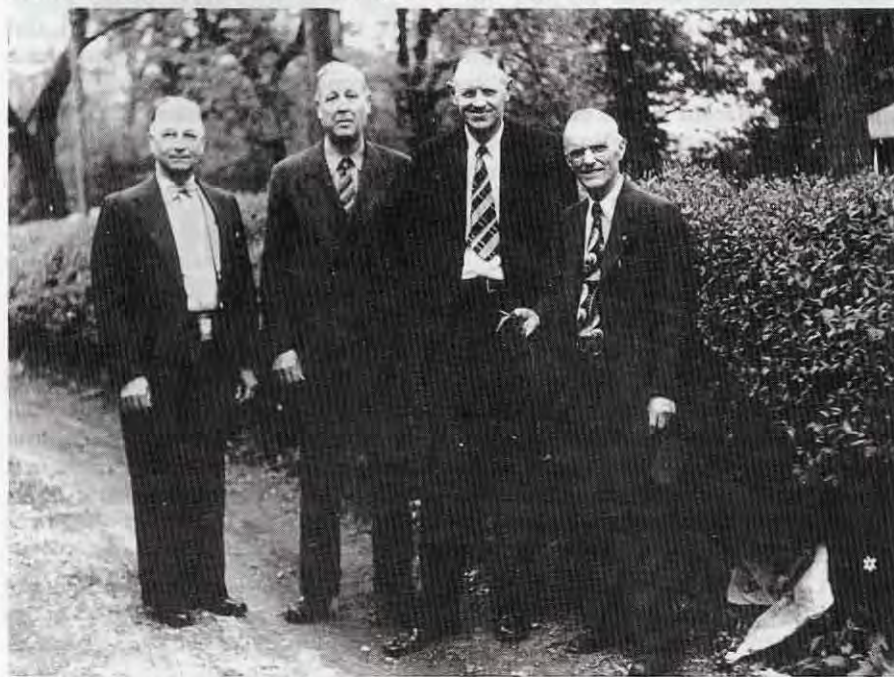
The story begins with the professor of beekeeping at Iowa State College (as it was called then) in Ames, Iowa. Dr. O.W. Park and two associates, Mr. F.C. Paddock the state bee inspector and, Mr. F.B. Pellett who managed the honey plant test garden of the Dadant organization. Their discussions led these three men to undertake a research project that was to see if bees were genetically resistant to the bacterial disease, American Foulbrood (AFB). They got out the message to beekeepers asking them to donate stock if they thought their bees (queens) were resistant to AFB.

They received donations from a number of beekeepers and I had the good fortune to meet and talk with one of the donators before he died a number of years ago. Charles Mraz remembered that he had sent a dozen or so queens to Dr. Park. I am sure there were others but I have

not been able to determine who nor how many contributed queens. These were used in the first test of 31 queens, seven of which were resistant to the bacteria. At that time their test criteria was to insert into the center of the brood nest of a healthy colony a section of comb containing the remains of at least 75 larvae killed by the bacteria, commonly known as "AFB scale." The comb sections were introduced in the late Spring or early Summer and the colonies were examined and inspected for disease in the early Fall.

The work was first reported in the *American Bee Journal* in 1936, with follow-up reports every year until 1939. By then their test program showed that they had achieved resistant bees in about 95% of the queens and after only a few years of selection. I would like to point out that at that time they did not use artificial insemination (AI) in their breeding program. They did not know queens multiply mated and their knowledge of genetics, especially of bees, was minimal. Daughter queens from these resistant lines were offered for sale to beekeepers in advertisements in the *American*

Park, Paddock, Jones (then secretary of ABF) and Pellet.

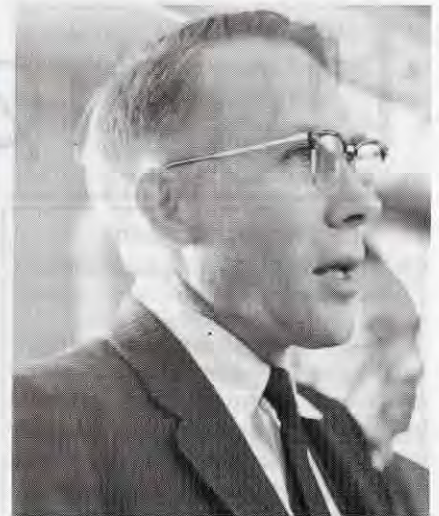


Paddock (r) and John Jessup, 1935.





Dr. and Ms. Park.



Dr. Walter Rothenbuhler

*Bee Journal* for the following 10 years.

Dr. Allen Woodrow of the USDA apiculture laboratory in Laramie, Wyoming had also begun working on the problem of susceptibility and resistance of bees to AFB. He found that larvae no older than 24 hours could be infected with the disease. After that very few larvae would die. He also found there was no difference in the susceptibility of larvae from resistant or susceptible lines. He did note that the dead larvae from resistant lines were removed faster.

In 1948 I had the opportunity to observe AFB resistant colonies infected with the disease while I was a student of Dr. Farrar at the University of Wisconsin in Madison, and I cite this example so if you wish to infect colonies with the disease you will know what to expect. Dr. Farrar had four colonies with resistant queens within the 350 colonies he and his students used to test different stocks. All Summer he worked and inspected these four colonies every 10 days for disease and would record the number of diseased larvae he observed on each inspection.

During the inspection I would stand in the background and watch as he would not permit any other person to work those AFB infested colonies. These were very large colonies with brood nests in excess of 750 square inches of sealed brood (one deep frame, completely full, top to bottom and side to side is 306 sq. in. On each and every inspection he would find from one to five cells with AFB dead larvae, rarely, he would find none. The colonies were obviously

infected with the bacteria but in actual fact they were not "sick" nor were they in any danger of being overrun by the disease. They produced honey crops equal to all the other colonies under test.

Beginning in 1951 Walter Rothenbuhler, who had just finished his PhD. program at Iowa State started his career working on the problem of the genetics of disease resistance. He spent over 20 years on this long-term project, assisted by his former student, Vic Thompson, and many other graduate students. It was shortly after beginning this work that he changed the terminology of "disease resistant" to "hygienic behavior."

Using AI, he developed inbred lines of several stocks he had obtained, one from a beekeeper in Iowa named Brown which was resistant to AFB. The other, very susceptible stock, came from New York from a beekeeper named Van Scoy. Rothenbuhler described the Brown line, which had considerable temper, as "bees that would staple your pants to your leg."

Inbred lines of bees are extremely hard to maintain and very few bee people of my acquaintance have the necessary skills to maintain such a line. It not only takes a lot of skill but a considerable amount of luck, too. At any rate some time about 1975 Walter Rothenbuhler's luck ran out and he lost his stocks. At the time I was working at the USDA bee lab in Tucson and I was a bit provoked that Walter had not passed any of his inbred stocks around so other people could work

with them and verify his work.

As you might not know, when a scientist makes a discovery, it is welcomed by others in the profession, but, and this is a big BUT, before it is accepted as fact it has to be verified by an independent scientist who has to get the same results. This had never happened, the stocks were lost and worse, nobody seemed to be interested in his work. He had talked to beekeepers at their meetings, written in trade and scientific journals but no person showed any interest. Looking back I think the reason so little interest was shown was because he never told anybody how any beekeeper, could go out and find these bees with hygienic behavior.

How to find HYG bees, where were they, could they be found, did they exist? While I was in my nice government office with my feet on the desk I began contemplating this problem. You know, feet on the desk, a cup of coffee and knowledge gained from many university courses, slowly but surely began to tell me that I could find these genetic characters if I would only go look. I am a bit ashamed to say how long this process took; many months, but finally I solved the problem, went looking and found hygienic bees (queens). The next part of this series explains how any beekeeper or scientist can do what Dr. Rothenbuhler, and then I did. ☐

*Steve Taber is a retired USDA bee researcher and was a commercial queen breeder. He now lives in South Carolina.*

# GLEANNINGS

JANUARY, 2001 • ALL THE NEWS THAT FITS

## USDA In Honey Business

### BUY-BACK BONUS

U.S. beekeepers will get an income boost via an enhanced honey loan program which is part of the emergency payments provisions of the FY-2001 Agricultural Appropriations Bill.

The loan deficiency payment provisions of the program are expected to provide a benefit exceeding 10 cents per pound for all 2000-crop honey – including that already marketed or already under loan.

In many ways, the program will be like the “buy-back” program for honey, which was last in place for 1993-crop honey. However, there are some differences, including the retroactive payments on

honey already sold and the conversion of the existing loans. Another difference is that the old marketing loan program had differentials for colors and classes, while it appears that there will be a single loan rate for 2000-crop honey.

USDA expects to make the LDP available during January.

The report of the new program has sent producers to speculating on whether to sell their honey now or whether to wait on the program provisions to be announced.

Producers interested in the program should maintain close contact with their local Farm Service Agency office for information.

### BEES DOIN' TIME

Inmates at Kingston Prison in Portsmouth are being trained as beekeepers after prison governor Stuart McLean gave approval for members of the Portsmouth Beekeepers Association to give the course.

“I thought it would be a really good idea because it would give the inmates something to work for, something to be interested in and something they can use on the

outside,” McLean said.

The training is seen as an important contribution because the number of trained beekeepers on the outside has fallen, leading to a drop in honey production.

“The bees are really important to the local ecology,” McLean said. “The prisoners don't leave the prison but this way they can do good in the community without actually bothering anyone.”

### AFB IN AUSTRALIA

South Australian beekeepers have accused their state government of putting Australia's honey industry at risk by not cracking down on renegade operators who are illegally using the antibiotic oxytetracycline to hide infestations of American foulbrood.

South Australian Member of Parliament Peter Lewis said state government spending cuts meant the state no longer had primary industry inspectors checking hives for the presence of AFB or the use of the antibiotic.

Lewis placed motion before

parliament condemning the state Government for firing its apiary inspectors and moving towards self-regulation of the industry.

The grower-owned Capilano company the world's third-largest honey company with honey production worth A\$57 million and exports to 40 countries said a crackdown on the rogue operators was needed immediately because they were putting multi-million-dollar exports at risk.

“If American foulbrood is not kept under control, it could ruin honey exports,” a spokesman said.

## GROCERY STORE WOES

Unsaleable items are costing the grocery industry an increasing percentage of sales, according to GMA.

A six-month study of grocery manufacturers and distributors by GMA and Fmi (Food Marketing Institute) found that the average cost of unsaleables – products that are destroyed or returned for manufacturers is now at 1.08% of gross sales, up from .75% in 1995. According to GMA (Grocery Manufacturers of America), unsaleables cost the grocery industry \$4.2 billion in 1998.

General merchandise, health and beauty, and refrigerated products were the highest-ranking categories of unsaleables. Unsaleables were the highest in convenience stores (1.4%), followed by grocery stores (1.3%), and drug stores (1.2%). The lowest percentages were in club stores (0.9%) and foodservice (0.6%).

Retailers and manufacturers with high compliance levels for either reimbursement rates or disposition instructions in their policies had below-average rates of unsaleables. Companies with a lo-

gistics division responsible for managing unsaleables also reported below-average cost rates.

According to the report, the chief causes of unsaleables include: senior management indifference, out-of-code products, good products going to reclamation centers, and pallet overhang. While many of these problems can be rectified within a company, others require more work and a change of longstanding attitudes.

According to GMA, the often longstanding lack of trust between trading partners can result in the use of redundant third-party processing facilities. The growing trend of multi-channeling as well as industry consolidation are also making the management of products more complex.

Participants in the study include The Clorox Company, General Mills, Hannaford Bros., Hunt-Wesson, Kraft Foods, Lipton, M&M/Mars, Meier, The Minute Maid Co., Ocean Spray Cranberries, Pillsbury, Playtex Products, Ralston Purina, Schunuck Markets, S.C. Johnson & Son, and Wakefern Food.

## Imported From Russia

### 20 HONEY BEE QUEENS

Twenty honeybee queens imported from Russia's eastern Primorsky region could soon become matriarchs of a new generation of U.S. bees that resist *Varroa* mites. ARS scientists imported the queens from Primorsky because heavy mite selection pressures there have forced the insects to develop natural defenses. In the United States, feral and managed bees lack sufficient natural resistance to the mite, which has become an invasive species here. Severe infestations of the blood-sucking parasite can destroy a hive unless checked with chemical miticides. But the cost of miticides, concerns over handling them, and the po-

tential for mites to develop resistance have fueled the search for bees that can withstand the parasite on their own. Summer 2000 marks the third time ARS researchers have imported Russian queens as a source of mite resistance for domestic bees, which pollinate about \$14.6 billion worth of crops. In spring 2001, ARS researchers will put the Russian queens and their American hybrid offspring to the test by infesting their hives with hundreds of *varroa* mites. Next, 40 daughter bees from the sturdiest hives will be shipped to commercial apiaries in Louisiana, Mississippi, and Iowa for further evaluation.

## What About The Flowers, The Birds And The Bees

# BETTER TREES THROUGH HORMONES

Plant hormones play critical roles in the growth, development, maturation, and senescence of plants. The ability to genetically regulate hormone levels provides researchers with a powerful tool for altering the outcomes of agricultural plant growth. Thomas Moritz and his team at Umeå Plant Science Centre in Sweden were able to increase wood biomass production in trees by enhancing gibberellin production(1).

Prior to the Moritz's study, genetic engineering of trees was primarily limited to producing trees that flowered earlier, were pest and herbicide resistant, and produced wood with preservative properties. Little was done using gene technology to precisely manage hormone levels in trees. Hedden and Phillips, of the Long Ashton Research Station of Bristol in the United Kingdom, recently commented that enough is known about plant hormone biosynthesis for investigators to be able to manipulate them in commercial plants(2). They added that many of the hormone-encoding genes have been cloned and are ready for exploitation in crops.

The hormone gibberellin is of particular interest to researchers because of its broad range of effects on plant growth and development. Several gibberellin studies in transgenic Arabidopsis, barley, tobacco, and other research models support its utility in improving commercially important plants. Recent studies elucidating gibberellin regulation have resulted in an improved ability to selectively control gibberellin biosynthesis in transgenic plants(3).

The gibberellins are comprised of a group of terpenoid hormones called the gibberellic acids (GA). These 19- to 20-carbon compounds are synthesized in plants

from four isoprene units. Many of the GAs are the precursors to the biologically active forms; some are glycosylated for regulation or short-term storage and transport purposes. GAs are most noted for influencing stem elongation and certain aspects of maturation such as flower stalk bolting and flower induction. Gibberellins are also associated with the timing of seed germination.

Moritz's team focused on the role of gibberellin to regulate xylem deposition in trees. Gibberellin biosynthesis was stimulated by overexpressing GA 20-oxidase, a key enzyme responsible for the production of biologically active GAs from inactive 20-carbon precursor gibberellins. Initial studies on Arabidopsis showed that regulating GA 20-oxidase could successfully modify gibberellin levels. The result of this technology is comparable to the traditional practice of applying exogenous gibberellins to modify plant growth.

One to three copies of the AtGA20ox1 gene from Arabidopsis was inserted into the genome of hybrid aspen trees in tissue culture using a pPCV702.kana vector controlled by a CaMV 35S promoter. GA 20-oxidase overexpression was achieved in ten transformed hybrid aspen lines, and the GA content in leaves and internodes was determined.

Transgenic trees with the AtGA20ox1 gene showed higher levels of GAs in both leaves and internodes, demonstrating that hormone biosynthesis was enhanced in the plants. The bioactivity of gibberellin was confirmed by measuring increases in weight of the stem and internodal tissues. Leaf size was greater in the transgenic trees; however, there was no sig-

nificant change in the number of nodes. The researchers achieved a 71% increase in xylem fiber number and an 8% increase in xylem fiber length in the transgenic trees. Moritz's team concluded that their technique was superior to using exogenous application of gibberellins. They showed an overall increase in plant growth as compared to exogenous application that results in increases in shoot growth at the expense of root growth.

This technique has potential for improving use of popular and underexploited commercial plants. Underexploited plants such as mesquite and kenaf could be altered using this technique to produce higher quality pulp than what is currently produced by the cultivated wild plants. Similar strategies with other hormones could enhance fruit production or tissue biomass for forage and industrial applications.

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Gauche was introduced in Canada in 1999. The Canadian Honey Council has asked the government to halt the distribution of Gauche but hasn't had a reply.

French beekeepers have claimed Gauche is the reason for a decline in the population of their colonies. They say their bees become disoriented after contact with Gauche treated plants, forget to return to their hives and eventually die.

## AUSSIE SMUGGLING

Only months after bee smugglers are believed to have introduced varroa to New Zealand, authorities in Australia have caught a beekeeper attempting to bring live queen bees into Australia.

The Australian Quarantine and Inspection Service intercepted and seized the bees on arrival at Sydney International Airport.

Agriculture Western Australia senior apiculturist Lee Allan said the illegal importation of live bees posed a major threat to the states A\$7 billion a year beekeeping industry.

Western Australia is free of some of the damaging bee diseases that occurred elsewhere in Australia. European foul brood is an endemic disease in other states, but is not present in Western Australia.

"If bees are imported illegally or quarantine is ignored, there is a risk that the destructive *Varroa* mite or European foul brood could be brought in with the bees," Allen said. "There is simply too much at risk if people ignore the quarantine regulations," he said.



## NEWS FROM CANADA

CALGARY Alberta provincial apiarist Doug Colter said an increasing incidence of American foul brood is beginning to be found in the Canadian province.

Analysis of samples from hives sent in by 28 Alberta beekeepers found evidence of AFB in eight that it's becoming resistant to the current antibiotic treatment.

"I'm afraid this fall when I start inspecting colonies it will be just the tip of the iceberg," he said.

The eight samples came from beekeepers with a combined 26,000 hives - 15 percent of Alberta's total.

WINNIPEG Manitoba beekeepers are expecting the cool, wet Summer to cut the honey harvest by about half. That sentiment was shared by Manitoba Beekeepers Association Phil Veldhuis who told reporters producers will likely harvest only about 100 pounds a hive about half of had been expected.

### At Least In Canada

## GAUCHO NOT A PROBLEM

A scientist at the University of Guelph in Canada said research indicates the insecticide Gauche will not affect bees despite claims to the contrary in France.

Professor of Entomology Cynthia Scott-Dupree performed tests on large-scale commercial plantings of Gauche-treated canola seed. She did the research

and a subsequent report for Bayer AG, which owns the Gauche trademark.

"We've looked at the impact of these treatments on honey bees in terms of their foraging activity, mortality of adult bees, honey production and behavior," she said. "There was no impact on bee behavior by any products we tested."



## ROGER MORSE FUND

Cornell University, due in no small part to Dr. Roger A. Morse, has trained more students in apiculture at the M.S. and Ph.D. levels than any other institution in the United States. In 1983, Roger A. Morse, then Professor of Apiculture and Director of The Dyce Laboratory for Honey Bee Studies, established *The Apiculture Lecture and Study Fund*. Its purpose was to provide funds to bring apicultural specialists from throughout North America and abroad to lecture and work with graduate and undergraduate students at Cornell. It also provides funds to enable graduate students to travel to other locations to conduct research and attend professional meetings and to promote apiculture among the general public. Lectures given by the visiting specialists are named for the four people who, over the past 20 years, have made especially generous contributions of \$5,000.00 or more in cash, time, or materials to the Dyce Laboratory for Honey Bee Studies. The current lectures recognize Dr. Arthur Arnold, Archie L. Coggsall, Charles

Leshner, and Harold A. Merrell. In remembrance of Professor Morse's many contributions to apiculture and to Cornell University, the fund was renamed *The Roger A. Morse Apiculture Lecture and Study Fund* shortly after his death in May 2000.

*The Roger A. Morse Apiculture Lecture and Study Fund* offers former students, colleagues and friends of apiculture throughout the world with a unique opportunity to recognize the many people who have helped make Cornell University's Apiculture Program the best in the world and to help ensure that Cornell University continues its long tradition of excellence in apicultural research, teaching and extension. Gifts of any size are welcome.

All contributions will be acknowledged by Cornell University and are tax-deductible. Check or credit card information can be sent to The Roger A. Morse Fund, Cornell University, Development Office, College of Agriculture and Life Sciences, 272 Roberts Hall, Ithaca, NY 14853

## Small South African Insect Helps NZ CONTROLLING VARROA

The New Zealand government approved a NZ\$7.5 million plan to manage the *Varroa* bee mite over the next two years.

Agriculture Minister Jim Sutton said the aim of the plan was to keep the South Island *Varroa*-free for as long as realistically possible and to minimize the economic impacts in the North Island.

"We need to do enough surveillance to pick up any incursion in early stages," he said.

Sutton said if *varroa* was detected in the South Island, the Agriculture would seek government funding to carry out a delimiting survey to assess the feasibility of eradication.

"Cabinet has approved research that will help in assessing the feasibility of successful eradication, as well as establishing a decision-making framework, preparing a response plan, and working with regional councils and other government ministries to make any response as effective as possible."

Sutton said it was vital that beekeepers be given the skills to deal with *varroa* and the government is funding a two-year program of

workshops, field days and other activities to ensure beekeepers had the knowledge necessary. The government is also funding a book about managing beehives with *varroa* under New Zealand conditions.

The National Beekeepers Association has been granted NZ\$20,000 a year for two years to allow it to purchase technical advice.

In Wellington a New Zealand scientist believes a small South African insect may be the answer to controlling *Varroa*.

Independent entomologist Barry Donovan told local reporters *Varroa* mite has done little damage in South Africa and he believes it is because the pseudo scorpion is eating the mites.

Donovan is looking for NZ\$15,000 from the government *Varroa* fund for preliminary research into the insect.

## MILKWEED IN IOWA

A census of the common milkweed in Iowa by U.S. Department of Agriculture scientists indicates the plant can be found along almost three-quarters of the roadsides and in about half of the state's corn and soybean fields.

Corn and soybean fields had the lowest average percent area infested with common milkweed – less than 0.03 percent – but these crops cover 78 percent of Iowa's landmass. Of the various other habitats surveyed – pasture, roadsides and undisturbed areas – lands in USDA's Natural Resources Conservation Service Conservation Reserve Program (CPR) had the highest percentage of area infested with milkweed (2 percent).

Common milkweed, *Asclepias syriaca*, is a native of the northeastern and north central United States and adjacent areas of Canada. It is the primary plant on which monarch butterfly eggs are laid and the main food source for monarch caterpillars.

The census was conducted by Douglas D. Buhler, formerly an agronomist at the Agricultural Research Service's National Soil Tilth

Research Laboratory in Ames, Iowa, now chair of the Department of Crop and Soil Sciences at Michigan State University-East Lansing. The study is part of the research response to concerns raised by a note published in *Nature* in June 1999 about a small, preliminary laboratory study on the potential for the pollen of Bt corn to cause harm to monarch caterpillars. Bt corn is corn that has been genetically modified to express proteins found in the bacteria *Bacillus thuringiensis*, to reduce the need for applying chemical insecticide to the crop.

The distribution of common milkweed is simply one piece of the picture helping to clarify the true risk, if any, that Bt corn might pose to monarch butterflies. Other pieces needed to complete the risk assessment include identifying monarch preferences for milkweed in particular habitats, the distribution and extent of Bt corn pollen during pollen shed, and the actual toxicity of Bt corn pollen to monarchs.

ARS is USDA's chief scientific research agency.

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*Happy  
New Year*

**T**hat was the name on the gold packet in the sugar tray at Moody's Diner, a famous restaurant on Route 1 in Waldoboro, Maine. I checked the contents and sure enough it contained honey. Even better, honey was listed first. Now I was really interested since honey usually shows up far down the list after sugar and other sweeteners on other so called honey products. I broke open a packet. It looked like a finely granulated sugar but tasted like a light, Summer honey. It was really honey and was delicious! I checked the packet to see who manufactured it and found it was distributed from Portland, Maine, and only 40 minutes from my home in Bath. I had to pay them a visit.

There I met Steve Riley, the President of HoneySweet. He is an energetic young man, full of enthusiasm for HoneySweet. He and his partner, Fred Masciagelo, had previously worked together in a distribution center in Portland. One of the products was HoneySweet. They were sure they could do a better job distributing what they saw as an exceptional product. So they bought the marketing rights; set up a business; took control of the brand under a licensing agreement; and have not looked back since.

HoneySweet was "developed by Emory Lockette of Tempe, Arizona in 1991 on the idea that there had to be an alternative to artificial sweeteners and sugar and that honey was the right place to start." Emory is a diabetic. He wanted a simple and easy way to carry honey with him. So, instead of jars of liquid honey, why not powdered? But the powdered honey he found was not the best tasting way to eat honey. It does have a honey taste, but the texture is like eating honey-flavored chalk. So Emory set out to make a better tasting powdered honey. The result was HoneySweet.

"Samples were created and presented to Albertson's Phoenix, his local supermarket. They liked it and it was approved as a new item. Emory then signed up a few small food brokers to gauge the response elsewhere in the country. Positive approvals sparked manufacturing and fulfilling of order, by hand, in Emory's garage. The quest for worldwide distribution had begun."

Steve and Fred went on the road to Trade Shows to bring HoneySweet to the eyes of buyers. They were able to sign on many supermarket chains, specialty stores and restaurants so that now HoneySweet is in six of the top 10 supermarket chains in the U.S. and is at over 5,000 locations, mostly in the Southeast and New England. It also has a foothold in Southern California and a smattering of other states.

The owners recognize that their main job is educating the public about HoneySweet. They are finding the product is their best salesman. Riley says, "At first it was one or two calls a week with people asking where to get the product. Now it's 10 or 12 a day and has gotten steady week-in and week-out." During the 45 minutes I was with Steve, their toll free number (888.203.1439) rang four times with people asking about HoneySweet.

HoneySweet is made from honey purchased from "Mid-Western Co-ops: and shipped to their manufacturing and packaging facility. It is converted to a powder by "Spray Drying," a process that includes heating the honey and spraying it through ultra

fine nozzles. The dried honey falls to the bottom of the container while the water is taken off. In this form, the powder is used in many applications including brand name cereals. To shift the powder to HoneySweet, a patented process adds fructose and maltodextrin to make a fine powder that gives an immediate honey taste. This product is used in cooking and is sold in jars. The product in the packets I enjoyed at Moody's is made more granulated and it pours just like a fine sugar.

HoneySweet has 11 calories per teaspoon compared to 15 for white sugar, or about three-quarters the calories of an equal amount of sugar. It is being marketed as a substitute for artificial sweeteners.

HoneySweet will soon be in other products. Salada Tea is test marketing an instant green tea with HoneySweet.

Consumers know honey is good. But they tend to buy one jar or honey bear and use it sparingly. But they enthusiastically purchase products that are value added containing honey, like cereals. So HoneySweet fills an important niche. The ability to have honey as a sweetener in a form already used by consumers, as a powder or granulated, increases its acceptance. It is an exceptional opportunity for the honey industry to increase the use of honey in the market-

place in direct competition with other sweeteners.

As Steve says, "Just like Equal in blue, SweetNLow in pink, we want the gold packets of HoneySweet on every table in America."



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