

FEB 2001



# Bee Culture

Looking For Hygienic Queens?  
Find Them On Page 24

Are These *Varroa destructor*, or  
*Varroa jacobsoni*?

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Skunk Cabbage is one of the first pollen producers of the season. Find out about pollen's value. Page 29



# Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

FEBRUARY 2001 VOLUME 129 NUMBER 2

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*Varroa destructor, or Varroa jacobsoni?*

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## KEEP IN TOUCH

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### Continue The NHB

The recent referendum to change the National Honey Board was not approved by the industry, necessitating a continuation referendum to be held this coming year. I feel that the defeat of the proposed changes do not signal a demise of the NHB, but rather a new step in the development of that board. We must continue to support the NHB, as it is the only tool we have to conduct honey adulteration research, to promote the health aspects of honey with scientific research, to help educate the consumers on all aspects of honey usage, and to exist as the main source of public information on many aspects of our honey industry. From the information given to us at the California convention in November, the NHB has several new and positive programs in the works.

I also feel that the NHB must be allowed to assess its programs in light of the just completed referendum. The NHB must listen to the whole industry, and react accordingly. The American Beekeeping Federation, The American Honey Producers Association, The National Honey Packers and Dealers Association, and all state and local beekeepers groups must make their views known to assist the NHB in that determination. All individual beekeepers must also let their views be known. Find out who your representative is on the NHB and write or call that person. Silence can only lead to assumptions that are not always correct.

I also urge the leadership of both national bee organizations to listen carefully to all of their members, not just to the ones that make the annual meetings, and to carefully interpret the results of any votes taken on this subject. A vote that passes by a simple majority is not a mandate by any stretch of the imagination. Remember that many of your members cannot attend those

# MAILBOX

expensive conventions, and are therefore precluded from voting.

The NHB deserves our support in the upcoming referendum to allow it to continue functioning. Without the Honey Board, we lose! Any effort to start another Honey Board would take many years to accomplish, if it ever was accomplished. The current make up of the NHB can be changed through the referendum process, and it behooves us to see that any changes are made wisely and with serious input from all parties involved. However, we need to continue the National Honey Board first, and then consider how best to help it evolve into the promotional and research tool that we all thought would happen.

Bob Miller  
Watsonville, CA

### GM Alternative

The controversy surrounding genetically engineered or modified foods is spawning controversy around the world, as reported in Time.Com. With visions of hope of improving lives, as in the discovery of "golden rice," to fear of destroying the ecosystem, as written in "Of Corn and Butterflies."

As early as 1996 a biology professor at Salisbury (MD) State University was researching how to increase crop yield without resorting to genetic engineering, or environmentally unsound methods. Dr. Mark Holland and his students have been investigating a biological alternative, bacteria.

Methylobacterium or "Pink Bacteria," as they are known, offer a low tech biotech alternative to genetically-modified crops. The bacteria, which are normally found on all plants, can be used to boost crop yields and plant performance.

Dr. Holland has conducted four years of field trials in collaboration with colleagues from the University of Maryland Eastern Shore testing "pink Bacteria" on soybean crops. During that time,

yields of treated plants were from 40 percent to more than 70 percent higher than those of untreated plants. This growing season they are working at three research sites, two on the Eastern Shore and one in Missouri.

Additionally, Dr. Holland, is working with scientists from Egypt to determine if "pink bacteria" will stimulate yield for faba beans, Egypt's biggest crop; preliminary results were favorable. (This program was a collaborative effort between SSU, UMES and the U.S. Department of Agriculture in Beltsville, MD.)

Dr. Holland and his lab have also demonstrated that the bacteria can be used to alter the nutritional quality of plants. Some bacteria strains seem promising. Although this last technology is probably several years away from the marketplace, using the bacteria to improve crop yield is ready for commercial applications.

For more information on Dr. Holland's research, please call the Salisbury State University Public Relations Office at 410-543-6030.

Gains B. Hawkins  
Asst. Vice President, Advancement

**Editor's Note:** Gains Hawkins is the Assistant Vice President of Advancement but also serves as the Director of Public Relations. The Public Relations Office falls under the Advancement Division of the University.

### Killer Bee Solution?

In Vietnam, the M18A1 green smoke grenade was used to disperse bee attacks. Could this be used for "Killer Bees?" What are your comments on this?

Sylvester Kollaja  
El Campo, TX

### Organic Honey?

A friend sent me your article on Organic Honey in the current

Continued on Next Page



# MAILBOX

issue, which is a good beginning. However, the subject is larger than Mark Winston suggests. At present, there are a dozen or two certified beekeepers in mainland U.S., with several dozen more in Hawaii, Canada and Mexico.

I enclose my analysis of 18 Organic Honey standards. Every year a few more appear as the conventional honey business becomes more and more intertwined with synthetic pesticides.

I believe American produced certified honey will bring two or three times the price of conventional honey. At present, I think the largest producer as around 10,000 pounds per year.

Arthur Harvey  
Canton, ME

## Bee Space Violations!

It is quite clear that bee space violations in manufactured equipment exist throughout the industry. I noted in last month's Bee Line the design problem between hive bodies and frame dimensions. I have been in contact with the U.S. Forestry Service and obtained specifications for shrinkage and expansion of various species of lumber relative to moisture content. *Many thanks to Mr. Darren Morris of the Western District of US Forestry Service located in Mayfield, KY for his very kind assistance and information.*

I believe most of the wood used in hive bodies we purchase is either Western White Pine or Bald Cypress, so I will use these two for examples, recognizing that other species will have different values.

**Western White Pine:** Green Moisture Content = 148% (based on ovenry weight)

Shrinkage to 0% Moisture = 7.4%

**Bald Cypress** 171% & 6.2%

Mr. Morris says that Moisture Content of wood kept outside with no shelter will average 28%.

Therefore I am suggesting an Industry Standard for hive body dimensions be established as follows:

Hive Body Depth = 9 7/16 +0 -1/8 inches with wood moisture content = 28%.

End Bar Length = 9 1/8 +0 -1/16

inches with wood moisture content = 28%.

These tolerances are manufacturable and should not be difficult to maintain with reasonable supervision of the process by equipment operators.

The above are dimensions and moisture content at time of manufacture. These specifications would provide a bee space of 1/4 to 3/8 inch. It is acknowledged that some shrinkage and expansion will affect bee space but not a noticeable amount. 28% moisture was chosen due to hives being exposed to the outdoor environment in their use.

So what has to be done? Equipment manufacturers must recognize that we have a problem with their products and be willing to take steps to correct it. This means acceptance of working dimensions that provide the correct bee space when assembled. It means keeping cutters sharp, adjustments made to produce correct dimensions during manufac-

ture and checking setups before and during production. Written procedures for correct adjustment and operation of equipment should be posted at work stations. Dimensions with tolerances for each product must be clearly written and understood by operators. Operators must be trained and clearly understand the importance of maintaining bee space dimensions.

What should beekeepers do? Do some measuring when you receive new equipment before assembly. If dimensions are not correct, contact the manufacturer, explain your findings and ask for replacement at their expense. If the supplier fails to acknowledge the problem or replace material, consider going to one who will.

Expect high quality products unless otherwise agreed upon beforehand. Get what you are paying for!!!  
The stuff should be right!

Gerald L. Burchett,  
Editor of Kentucky Bee Line



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JOHN LORALE





# INNER COVER

**O**ver the Holidays there was lots of news in Cleveland and other areas of the country about the financial troubles of a company called LTV Steel. It's a big company. Thousands of employees. Millions and millions of payroll dollars pumped into local economies. Lots of taxes paid, too.

The problem? There are two problems, actually. One is foreign competition. Cheap foreign competition.

Too cheap, it seems. About a dozen countries have been dumping steel of similar quality in this country without significant enforcement of existing trade regulations. Why? The strong U. S. dollar. Why the lack of enforcement? Lack of government oversight was blamed, but why wasn't there enough? Some of the countries doing the dumping have been under special care lately, and letting them dump a few (thousand) tons of cheap steel was considered inexpensive and unobtrusive foreign aid. And, some countries actually produce steel for far less than LTV has been lately.

While the local news analysts were examining the crisis from all angles (and company, bank and community leaders sought to solve the problem on a local level), one thing became clear. LTV Steel produces steel on a grand scale. Lots and lots of it. "Steady. Quality. Consistent. Efficient (at least as efficient as possible)" were the phrases commonly used to describe the product they produced. Still, LTV Steel is in trouble.

The other problem they are having is that business has slowed. Demand for their product dropped. It's been doing that all year, actually. Their stock price went from just over \$4.00 to less than 50 cents during the past 12 months.

Meanwhile, the analysts explored the other steel companies that have risen like Phoenixes from the rust belt and have been successful. Why did some (not many, but some) succeed? And why did LTV stumble? Those that succeed, it seems, were the smaller (though not necessarily small) 'custom' companies. They built to spec for automobile manufacturers, for garage door companies, for prefab warehouses, for purposes that people needed filled.

And these companies did other things to make themselves lean and mean and tough and clean. They dealt with unions. They dealt with old vs. new technology. They dealt more with communities and less with politicians. They were environmentally aware of the footprint their presence created. And they put the consumer, the customer first.

LTV has had less latitude in all of these over the years. It was designed to produce lots and lots of regular steel. In rods or coils or sheets. And if that's what you want, then here it is. To their credit they saw the handwriting on the wall and purchased smaller companies that did what they could not do...cater to the small, the customized market. That in itself led to lots of debt and to at least some of the cash problems they were experiencing at year's end.

Not unlike other businesses in this country, when demand slows price becomes king. And countries dumping steel here for U.S. dollars, or countries that were just more efficient got the business. Unfair? Definitely. Dumping is an unfair trade policy and LTV can't compete. The small companies they bought were, however, competitive with the efficiently produced imported products, but they just weren't big enough to carry the rest of the company that was in a cash poor situation.

LTV will play this out somehow. They filed for Chapter 11 several years ago and made a comeback. They will probably do it again. But the parallels between this industry and beekeeping are worth exploring, especially the im-

*Continued on Page 45*

## Common Truths





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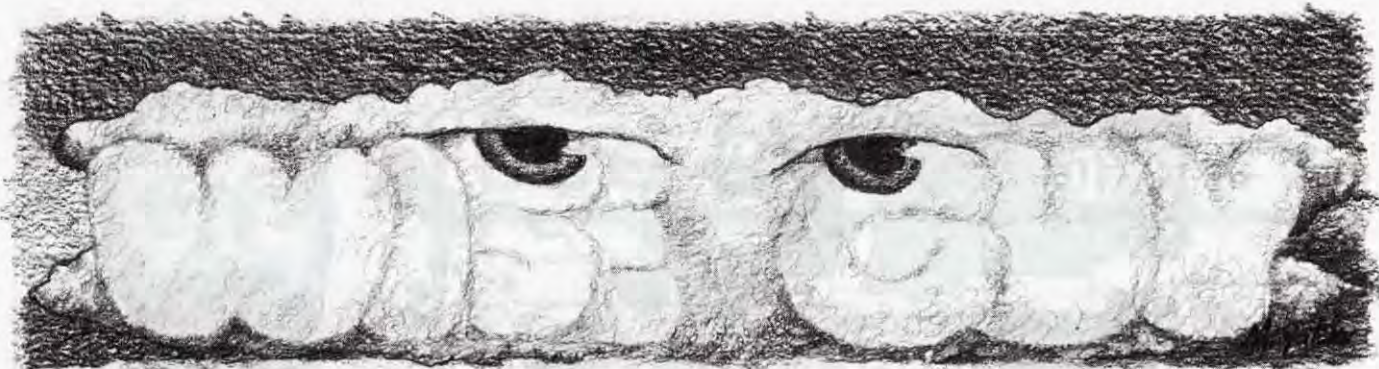
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*Continued on Page 45*

## Common Truths





Not all the nuts are on the trees in California. Some are driving one-ton trucks moving bees! I am amazed at some of my California friends that complain about carpetbagging midwest beekeepers coming to their state and impacting the pollination industry. There is a simple answer. Work with the rest of the industry to get at least 75¢ per pound of honey and most of the midwest competition will disappear. It looks as if California beekeepers worry about their small world and don't seem to become involved in the "big picture" world of honey.

They seem content to continue to live with things as they have always been. They complain about competition on pollination, but I believe if honey prices don't rise they will have the same view as the Captain of the Titanic, only the tip of the iceberg. More and more carpetbaggers are coming to California to seek almond pollination money. And

after a few years the carpetbaggers will start to stay in California and instead of just doing pollination they will go after a honey crop. No? Check out what happened to Florida years ago with midwest beekeepers moving into the state and not leaving.

It probably won't look like the Gold Rush of "49," but remember there are still another 400,000 hives of bees on pallets from ND to TX that could still come west looking for almond money. Now there is also some real interest in east coast pollination by those mid-west beekeepers. There was an article in a national magazine recently where the east-coast pollinator said he takes his best bees to the apples and sends the rest to the Maine blueberries. How happy were the blueberry growers, do you suppose?

If pollinators don't work to raise honey prices then hang on because pollination competition will increase. Hundreds of honey producers are

desperate for income. Any income.

There are also more and more carpetbaggers pooling their bees with those of smaller beekeepers so the small operator does not have to make the trip but still has some income. These kind of relationships will only get stronger and stronger. Soon you will see huge blocks of bees that will pollinate all over the United States. Anywhere there are crops.

California beekeepers listen up: If pollination is a good source of income, you better work to protect it. If you don't want to jeopardize it you may want to work with the industry and improve honey prices or pollination prices may go the same way as honey prices. Then we all are in a sinking boat.

This whole thing is like the people that raise money for cancer. They don't just solicit money from cancer victims, they ask everyone. Give, so others can live.

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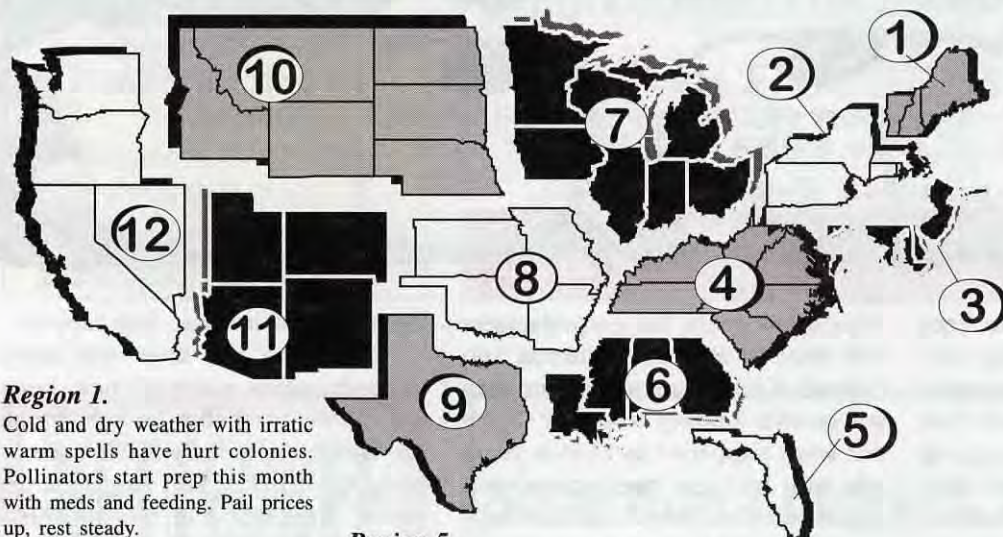
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# FEBRUARY - REGIONAL HONEY PRICE REPORT



## Region 1.

Cold and dry weather with erratic warm spells have hurt colonies. Pollinators start prep this month with meds and feeding. Pail prices up, rest steady.

## Region 2.

Bulk prices up a bit, everything else down. Cold and mostly wet weather so far, not too many problems. Pollinators start mid March with meds, feeding syrup, pollen and requeening.

## Region 3.

Prices steady since last month. Mixed weather is causing problems too warm, too cold. Feeding, meds and requeening start in late February, March.

## Region 4.

Bulk prices down a tad, all others steady. Cold, wet weather the main here, but not too many problems. Pollinators begin meds and feeding early February.

## Region 5.

Retail down a little, but all others steady. Cold and warm and dry all mixed together. Pollinators moving to citrus for early buildup.

## Region 6.

Prices steady across the board since last month. Cold, wet weather the norm, but not a problem, so far. December and January (when not too much snow/ice) pollinators start feeding sugar and pollen.

## Region 7.

Prices down, though not much, across the board this month. Cold, cold, cold, snow, snow, snow has made life miserable. Pollinators start (if at all possible) feeding and treating in early March.

## Region 8.

Retail, pails, bulk all up, wholesale prices steady. Cold and dry, or wet, depending on where you are, weather causing some problems. Pollinators starting now to feed sugar and pollen, apply meds and even make splits.

## Region 9.

Wholesale prices down a bit, all the rest steady. Some pollinators getting ready now, or earlier, for early crops, build up for splits and nucs and queen production. Meds, feeding sugar and pollen going strong. Cold, wet weather prevails.

## Region 10.

Wholesale prices rising slowly, all the rest steady. Cold, dry (mostly dry, anyway) weather causing some problems. Most pollinators in California, feeding and medicating already.

## Region 11.

Prices steady across the board. Cold, wet weather pretty much the norm so far. Not pretty we're told. Most pollinators in California, or ready to go. Feeding and medicating underway.

## Region 12.

Retail prices up, wholesale steady, bulk and pails down. Warm and dry weather has been a mixed blessing so far, more good than bad. Pollinators work pretty much all season staying on top of things. Real busy now.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Month	Last Yr.
<b>Extracted honey sold bulk to Packers or Processors</b>																
<b>Wholesale Bulk</b>																
60# Light (retail)	67.61	78.00	74.00	72.00	75.00	64.67	59.57	69.00	70.00	62.00	71.56	63.00	45.00-100.00	69.68	69.29	69.25
60# Amber (retail)	66.14	69.88	68.00	69.50	67.50	62.50	58.75	64.50	60.00	52.00	69.76	59.76	52.00-120.00	67.29	66.07	66.15
55 gal. Light	0.59	0.68	0.64	0.64	0.60	0.60	0.58	0.64	0.64	0.54	0.60	0.60	0.49-0.80	0.63	0.62	0.60
55 gal. Amber	0.55	0.65	0.62	0.68	0.55	0.53	0.53	0.62	0.51	0.50	0.50	0.52	0.42-0.85	0.58	0.57	0.58
<b>Wholesale - Case Lots</b>																
1/2# 24's	29.29	30.98	32.81	33.34	32.81	25.83	28.13	32.81	27.00	32.81	32.81	34.40	23.65-44.40	30.39	30.71	28.43
1# 24's	41.75	39.49	48.00	46.20	38.00	44.50	39.56	43.28	43.50	42.00	48.00	51.60	26.10-56.40	42.90	43.85	43.73
2# 12's	38.61	38.59	45.60	45.53	40.00	36.30	36.17	42.36	40.50	45.40	40.56	40.50	29.40-52.58	39.71	39.39	39.07
12 oz. Plas. 24's	35.39	35.78	44.40	34.34	35.00	40.40	34.25	33.92	40.00	35.60	36.00	38.40	26.40-48.00	36.35	37.26	37.43
5# 6's	40.02	39.86	44.00	42.00	42.10	42.00	38.81	39.00	48.00	41.25	42.10	42.10	30.50-54.00	41.80	42.02	41.93
<b>Retail Honey Prices</b>																
1/2#	1.78	1.65	2.83	2.17	1.99	1.57	1.48	1.99	1.90	1.49	2.83	2.49	0.95-3.60	1.81	1.80	1.76
12 oz. Plastic	2.19	2.21	2.90	2.24	2.46	2.32	1.77	2.87	2.44	2.00	1.99	2.35	1.09-3.94	2.23	2.31	2.26
1 lb. Glass	2.72	2.38	3.00	3.12	2.60	2.68	2.27	3.36	3.24	2.32	2.99	3.09	1.58-5.29	2.75	2.88	2.76
2 lb. Glass	4.25	4.25	4.80	5.74	3.87	3.83	3.77	5.00	4.39	3.96	4.71	4.75	2.79-6.00	4.33	4.39	4.50
3 lb. Glass	6.25	6.47	7.80	7.50	6.50	7.00	5.06	6.25	7.00	4.79	5.99	6.70	3.89-10.00	6.41	6.51	6.17
4 lb. Glass	7.18	6.73	8.05	10.00	8.05	7.03	6.77	7.99	7.00	8.50	8.05	8.05	4.59-12.00	7.56	7.26	7.66
5 lb. Glass	9.09	9.34	11.00	11.18	10.00	8.00	8.50	10.99	9.00	8.95	7.89	10.35	7.69-14.00	9.35	9.46	9.13
1# Cream	3.49	3.34	4.77	4.23	4.77	3.13	3.39	2.86	5.99	2.29	3.99	3.05	2.25-8.59	3.48	3.08	3.32
1# Comb	3.86	3.95	3.60	4.48	3.67	4.33	3.84	4.49	3.76	3.67	3.67	4.50	1.95-5.00	4.06	4.33	4.25
Round Plastic	3.25	3.11	3.60	4.00	3.25	3.50	3.20	3.99	3.30	3.40	5.00	3.50	1.30-5.00	3.46	3.69	3.95
Wax (Light)	1.41	1.92	1.25	1.38	1.15	1.50	1.55	1.95	2.10	1.85	1.85	2.33	1.10-5.00	1.46	2.54	2.35
Wax (Dark)	1.08	1.02	1.00	1.08	1.00	2.00	1.42	1.30	2.00	1.54	1.00	1.54	1.00-4.50	1.13	2.14	2.08
Poll. Fee/Col.	36.10	41.40	31.50	42.50	32.50	33.33	37.57	40.00	20.00	37.43	37.43	35.33	20.00-55.00	37.29	37.52	37.61



Mark Winston



# Bee Masters

---

“A half century hasn't changed the philosophy of John Corner's course.”

**F**ebruary is Bee Masters month, and has been every other February since 1952, when the first Bee Masters course was offered in Vancouver, British Columbia, Canada. It was a different course then, and beekeepers lived in a quieter kind of world, but the idea of bringing a group of beekeepers of diverse backgrounds together for an intensive period of training and fraternizing has not lost its timeless appeal.

The first course was conceived and organized by one of the great gentlemen of Canadian beekeeping, the provincial apiculturist John Corner. John was, and still is, an individual who considered public service through the government to be an honor rather than a paycheck, and he conducted himself accordingly. He first served with distinction in World War II, defending the cold and barren islands off the coast of Alaska before setting off to liberate Europe on the beaches of Normandy. Once the war ended, he returned to Canada to serve the beekeeping community with dedication and commitment from the end of the war until the early 1990s, when he retired.

John grew up in the small town of Nelson, high in the Kootenay Mountains of British Columbia, then and still a place of stunningly beautiful mountain passes and crystal-clear lakes and rivers. Despite his small-town background, Corner always saw things from a broad per-

spective, and his career was highlighted by the distinctive vision of an international beekeeping fraternity. His love of beekeeping and beekeepers took him around the planet through international aid programs that brought his extensive expertise and knowledge to Africa, Asia and South America, but his greatest legacy has been the Bee Masters course in his home province.

The structure of the course was simple, and unusual for its time in bringing together an international mix of beekeepers and experts for an intensive two-week period of study and interaction. Life was slower then; it could take many days for even British Columbians to drive down to Vancouver, and two weeks out of a beekeeper's schedule was not considered to be nearly as extravagant a time investment as it would be today. The first courses were slow-paced and relaxed, with classes only in the mornings and study, recreation or just touring the city with fellow beekeepers taking up the afternoons.

The Bee Masters also was unusual in its mix of teachers and students. Internationally recognized scientists shared the podium with extension specialists, regulatory officials and experienced beekeepers, and the boundaries between teacher and student quickly broke down. The lectures themselves were long and detailed, without the slick audiovisual aids we rely on today, but with lots of discussion, questions and sharing of information between the podium and the audience.

The course quickly developed an

international reputation, largely because of its unusual mix of town and gown. The Bee Masters has always been held at a university, first at the University of British Columbia and more recently at Simon Fraser University, and draws heavily from the students and faculty at these institutions for expertise. Today's joint sponsorship by the British Columbia Ministry of Agriculture and Simon Fraser University provides a unique blend of perspectives that continues to keep the course focused broadly on every aspect of contemporary bee science and management.

This university component in a beekeeping course reflected a central component of Corner's vision, that university science and practical beekeeping should and could be considered a seamless whole, with the twin pillars of basic knowledge and practical application supporting the same edifice. This course structure recognized the inherent interest beekeepers have in the biology of honey bees and also the useful applications that university scientists should apply to the interesting and curiosity-driven things they discover about bees.

The course has evolved since Corner's time and today is faster-paced, more intense and less gracious, recognizing the speed and focus that characterize contemporary work and recreational environments. Nevertheless, we have tried to retain John's vision of blending university research, practical extension and an international flavor. The course remains a fine opportunity for



beekeepers to spend a week sampling the latest fundamental knowledge and pragmatic management tools that the beekeeping community has to offer.

Recent Bee Masters courses provide a snapshot glimpse into the status and ongoing evolution of bee science and beekeeping. A few years ago, the course was dominated by talk of mites and mite control, Africanized bees and swarming. This year's course includes those topics, but also has a flurry of lectures on pollination by honey bees and other species. In addition, we've beefed up the sections on American Foulbrood and the impact of agricultural pesticides, always significant topics whose importance has increased even since the last course. We also added Integrated Pest Management as a theme underlying many of the lectures on disease control, in order to promote reduced pesticide use within colonies.

The course continues to be seasoned with the spice of beekeepers from every corner of the globe. Over the last few years, attending beekeepers have come from Canada, the United States, Peru, Mexico, New Zealand, Australia, Africa and Asia. The diverse perspectives they bring to the discussions in and outside the classroom remain among the most treasured components of

the course.

Perhaps even more important than their countries of origin are the diverse types of beekeepers the course attracts, and their equally disparate ages, careers and personal histories. While some beekeeping experience is required, we have had students in the course who are hobbyists with only one hive and commercial beekeepers with 3,000. Our youngest student was 15, and the oldest over 80; the highest educated with doctoral degrees, and the least educated without their high school diplomas.

Career backgrounds are equally diverse, ranging from housewives to physicians, government employees to full-time farmers and beekeepers, businessmen who arrive the first day in suits to police officers who sit ramrod-straight throughout their entire week of classes. Yet, they all hold a love of bees and talking about bees in common. Even by the first coffee break they have begun arguing about the best type of hive tool to use, discussing whether formic acid or Apistan can better control mites, or moaning like fishermen about the honey crop that got away last season.

The course's educational value runs in both directions, from lecturer to registrant, but also from beekeeper to university student. My undergraduate and graduate students deliver about half the lectures in the course, but they learn as much as they teach from the formal questions and discussion as well as the informal coffee break and lunchtime conversations.

We also offer two laboratory sessions, one on bee anatomy and the second on disease diagnosis and treatment. The anatomy session is marvelous, giving beekeepers an opportunity to see the fascinating parts of the bee up close and personal through microscopes not often available on a beekeeper's budget. The disease laboratory also is instructive, as many beekeepers get to see all sorts of diseases they might find in their hives without previously having been able to diagnose the problem or identify the treatment options.

We bring in frames of American Foulbrood, of course, pulled from our hives over the preceding years and kept frozen for the course. The odor


of these AFB frames pervades the room, emphasizing the importance of vigorous management for this increasing disease.

The most serious part of the course is an examination, held at the end of the intense Bee Masters week. This is the first test many in the room have had in many years, and it shows. Students take it seriously, staying up late the night before to study, and sweating buckets the morning of the test. Those who pass receive a coveted Bee Masters certificate, signed by all the special guest instructors, providing not only bragging rights but also conferring the right to serve as inspectors for the province of British Columbia.

The course has developed a few fun traditions on the side, including a banquet at one of Vancouver's many Chinese, Greek or Italian restaurants, and also a limerick contest. The best limericks are published in the Canadian beekeeping journals, at least the ones that are fit for a family audience. The unfit ones have been known to make the rounds of E-mail lists, although we claim no responsibility for their travel around cyberspace.

There seems to be a place and a need for more such courses. Our 50-person limit is quickly reached every offering, and we have to turn away numerous applicants. Many details of the Bee Masters course have changed over the years, but John Corner's vision of a course that combines science and practice, Canadians and beekeepers from the United States and overseas, university professors and hobby and commercial beekeepers remains a viable and exciting blueprint for beekeeping education.

In today's information-rich era, it's refreshing to realize that there still is no replacement for people-to-people interactions, face-to-face rather than computer-to-computer. The opportunities for exchange, discussion, talk and fun provided by taking a week out of our lives remain precious and priceless.

For more information about the 2001 course (February 26-March 3), visit our Web site at [www.sfu.ca/beamasters2001/](http://www.sfu.ca/beamasters2001/) 

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

*John Corner, when the course was new, and less hurried.*





# ? DO YOU KNOW ?

## Queens

Clarence Collison  
Mississippi State University

Since the success of a colony is ultimately dependent upon the queen and workers, colony management is primarily focused on them. Even though there are those that believe that the queen is in complete control of all colony activities, research has shown that both workers and queens have regulatory behaviors that impact the biology and productivity of the colony. Even

the presence of drones may improve colony morale, especially during the time of honey flows. Since a colony cannot survive for any length of time without a mated queen, this month's test will determine how well you understand the queen.

Please take a few minutes and answer the following questions on this important topic.

*The first nine 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. \_\_\_ The queen honey bee leads the primary swarm out of the hive during the swarming process.
2. \_\_\_ Young queens will lay later in the fall and initiate brood rearing earlier in the spring than older queens.
3. \_\_\_ Queens are highly specialized and when they are in isolation, they are unable to feed themselves.
4. \_\_\_ Queens leave their hives during orientation flights, at the time a colony is swarming or absconding, and for cleansing flights in the spring.
5. \_\_\_ Queen honey bees normally go on their mating flights in the morning.
6. \_\_\_ The queen's sting aids in the laying of the egg in the bottom of the cell.
7. \_\_\_ Queenless colonies are more aggressive than queenright colonies.
8. \_\_\_ Queens are sexually mature when they emerge from the queen cell.
9. \_\_\_ Virgin queens pay little attention to unsealed queen cells.

12. \_\_\_ The queen honey bee has \_\_\_ pear-shaped ovaries.  
A. Three  
B. One  
C. Five  
D. Four  
E. Two
13. When a queen is stationary on a comb she is surrounded by a circle of attendants known as the queen's court or retinue. Describe the behavior of the workers making up the court toward their queen (2 points).
14. Name two situations which will result in a colony being headed by a drone layer. (2 points).
15. Give three reasons why a beekeeper would consider requeening a colony. (3 points).
16. Name three approaches of introducing a new queen to a colony that you are requeening. (3 points).
17. What is the first step in requeening a colony? (1 point).
18. Please give two advantages of having marked queens in your colonies. (2 points).

ANSWERS ON PAGE 46

Multiple Choice Questions (1 point each).

10. \_\_\_ Young queens emerge from their cells approximately \_\_\_ days after hatching from the egg.  
A. 21  
B. 18  
C. 16  
D. 10  
E. 13
11. \_\_\_ If under the emergency impulse, the bees construct a queen cell around a 48 hour old larva within a worker cell, the queen will emerge from her cell in \_\_\_ days.  
A. 16  
B. 13  
C. 21  
D. 11  
E. 12

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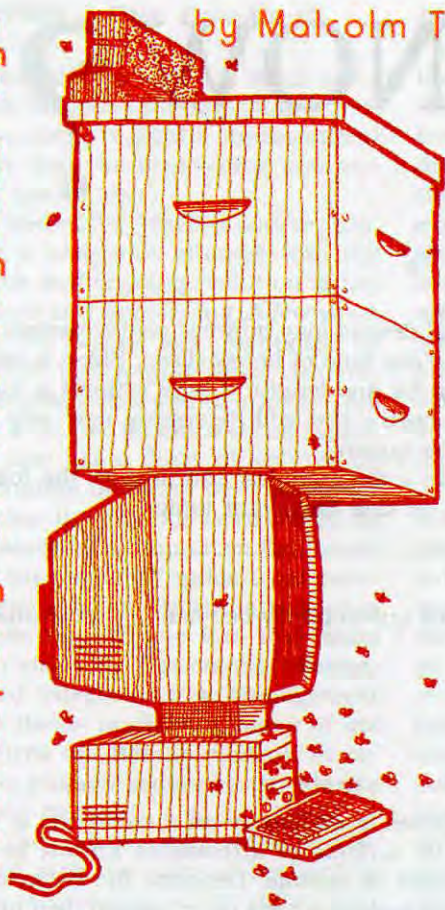
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As the digital age matures, those studying the **future** say information about certain topics will increasingly be found by looking outside any particular specialty. We have examples of this all around us. They include everything from the present myriad uses of **Teflon®** to DNA technology as the ultimate arbiter in solving **crimes**. In the apiculture field, there have been few developments that can be categorized as "inside the field" since perhaps development of **instrumental insemination**. Even that may be debated. Many of the other advances have come from improvement in transportation, building material (e.g. plastic) and food technologies. The latter is particularly important because it not only has produced a new food beekeepers can use (**high fructose corn syrup**), but the same material has also become a potent **honey** adulterer, which is affecting the worldwide market.

Perhaps the best example of the importance of accessing information outside one's field is the current situation with reference to what are called **transgenic plants**. At first glance, these purposefully genetically-modified organisms (GMOs) appear to have little to do with honey bee culture. Just as quickly this notion is dispelled by the realization that insect pollination is a major way plants are propagated. So these insects can expect to be materially involved in moving genetically modified material around, perhaps contributing to spreading it in unexpected ways and to unwanted places. In spite of its importance, pollination is something plant breeders and producers often relegate to the **sidelines**, but this will now no longer be as acceptable, in the long

## Information Outside One's Field: The Case of GMOs

run providing more awareness of the honey bee's contribution to agriculture and society. Besides pollination, honey bees may also be affected by differing qualities and quantities of nectar secreted by transgenic plants and/or using the modified material (nectar and pollen) itself in their **diet**.

Concurrently with the need to examine information from many sources, comes development of the **World Wide Web**. With this technology the ability to **search** across many fields or disciplines becomes easier. For example, entering the terms "transgenic plants and honey bees" into one of the **leading** search engines with the **URL** written as <http://www.google.com/> returns over 440 entries, with only a few mentioning the role of honey bees or apiculture. At the top of the list is the most relevant. Thus **Information Turntable for GM -Free Production**, describes possible effects of honey bees transferring genetically modified pollen and the possibility that this material would also **contaminate** organic honey products. In addition, there's a link to a **paper** by Dr. Wolf Engels Zoological Institute, University of Tübingen, Germany titled: What are the Possible Effects of Transgenic Plant Products on Pollinators, Especially Bees? The provocative conclusion: "The international companies involved in the transgenic seed market should provide the public with scientific information about these aspects, and research in this field by independent experts is strongly recommended. Not only possible ecological impacts but also the acceptance of new transgenic products by consumers require a careful public handling of all the safety aspects, regardless of the estimated magnitude of possible non-target effects. Pollinators, and especially bees, are of prime importance in this context." Both of the above are European sources, which would simply not have been available to most in this country or elsewhere before the digital age.

Most sites referenced agree that much more research is needed on GMOs. However, doing these studies will take energy, expense and time. Advocates of the technique say we have little of these to waste and by working now we can put in place the technology and the infrastructure required to feed the world for centuries to come and improve the quality of life for people worldwide. This argument is mistaken, according to **Physicians and Scientists for Responsible Application of Science and Technology**: "The belief that genetic engineering may contribute to the development of crops that would contribute importantly to global food production within a foreseeable future is not supported by scientific facts...world hunger is not the consequence of food shortage but of socioeconomic factors." Nevertheless, another group, **AgBioWorld**, devoted to bringing information about technological advances in agriculture to the developing world, believes that recent developments in plant science, such as biotechnology, can and should be used to increase crop yields, grow more nutritious plants and reduce dependence on chemicals in order to alleviate hunger and to help pre-



serve the environment. Others insist on a go-slow approach as there is a large list of **possible problems** this technology might spawn if used prematurely. These include: exposure of farm workers and food processors to transgenic DNA in dust and pollen; transfer of antibiotic resistant marker genes to (intestinal) gut microorganisms; transfer of antibiotic marker genes to environmental organisms; transfer of transgenic DNA into mammalian cells; and ampicillin resistance marker gene compromising treatment for meningitis. Unfortunately, there is reason to believe that the voices of the most dispassionate persons in the debate, **the scientists actually doing the work**, have often been lost in partisan cacophony.

With so much information available from outside the field, it is difficult sometimes to determine the core tenants of an issue like GMOs. The flip side is that for this topic in particular, paradoxically there often is a lack of suitable information. Much of the technology has been developed with private rather than public funding. This represents a great paradigm shift and conundrum in scientific circles. How can or should commercial interests be protected, while at the same time public interests be fully informed. Dr. Mark Winston in the July, 2000 *Bee Culture* (Vol. 128, No. 7, pp. 13-14) tried to get data on research carried out by companies concerning GMO effects on honey bees with little success. Fellow scientists would not tell him what crops were tested, where the data originated (industry, independent sources), experimental protocols used and results obtained. Dr. Winston concluded that there is absolutely **NO** reason for this information to be kept confidential. He found the same reticence from governmental sources as well, quoting one of his contacts as saying, "Secrecy is business as usual as far as we're concerned." Dr. Winston doesn't have the "deep distrust" shown by some groups about industry-generated data, but does share the opinion that anything less than full disclosure of information pertinent to human and environmental health is an affront to the public interest."

Full disclosure lies at the heart of the labeling debate. **The Campaign to Label Genetically Engineered Foods** seeks to take the mystery out of the food supply by one simple step, labeling genetically-modified foods. Visiting the Campaign's web site reveals another potential of the World Wide Web, taking action using electronic technology. For example, one can sign an **electronic petition** that foods containing GMOs be labeled as such, **write letters** to congress, government agencies, grocery stores and food manufacturers, and **send electronic mail** to the media asking them to cover GMOs. According to the campaign, two-thirds of all foods on supermarket shelves are genetically engineered. Shouldn't you have the right to know what you're eating? Labeling will: 1) foster consumer awareness of genetically engineered foods, 2) bring issues out into the open, and put pressure on agribusinesses to make a more compelling case for genetic engineering, 3) protect people who have allergies, 4) assist people who have religious or ethical problems with GE foods, 5) give people the option of whether or not to support the genetic engineering industry, and 6) help the U.S. avoid a trade war with the European Union.

Industry and governmental response to labeling is

that this is deemed unnecessary because U.S. consumers have faith in their food safety system and GMO food is basically no different than other food eaten by the general population. And there's much more to labeling than first meets the eye as revealed by a **paper** by Dr. Julie Caswell, published in the *AgBioForum*, a quarterly on-line magazine devoted to the economics and management of agricultural biotechnology. "Labeling affects the entire supply chain for food products. It requires definition of the attribute to be labeled (i.e., what is a "GMO"?) and segregation of products with and without the characteristics throughout the supply chain from seed inputs to the supermarket shelf. Because of this effect, labeling policy can be, and is even more frequently perceived to be, a Trojan horse bearing a broader policy and attitude toward the acceptance of GMOs in food products."

Voluntary versus mandatory labeling are also being debated. As Dr. Caswell concludes: "For the United States, the current voluntary labeling policy may well deliver the best balance of benefits and costs. Certainly FDA's recent policy announcements reconfirm its commitment to voluntary labeling. However, given their own circumstances, mandatory labeling is viewed to be the best choice for trading partners such as the European Union. Marketers and trade negotiators should recognize this and move toward living with diversity in labeling policy."

Certainly there is a lot to understand concerning GMOs. Much of the information to do so is available on the World Wide Web and little is related to or even mentions the role of apiculture or honey bees. Several sites, for example, tell the **history** of the technology in some detail, as well as describe techniques used. These include methods for **introducing genes** into plants, infecting plant cells with plasmids as vectors carrying the desired gene and/or shooting microscopic pellets containing the gene directly into the cell. The **successes** attributed to the technology, such as insect, disease and herbicide resistance, as well as improved nutritional quality are also widely documented. Active organizations in this arena include the National Agricultural Biotechnology Council (**NABC**) and the **Biotechnical Industrial Organization**. With these or any sites, it is important to know what supports them financially and the extent of their objectivity.

Several sites seek to be portals or clearing houses of information on biotechnology. **The National Biotechnology Information Facility**, for example, is divided into three sections of related information. The **Educational Resources** section has a listing of high school **educational activities** such as **transcription and visualization** and **description of blood typing**. **Courses and tutorials, games and workshops** are also found there. The NBIF "**Internet Resources**" database consists of well over 3300 annotated links to various internet sites with bioinformatics tools, research information, educational resources, careers industry information, and more. Finally, there is the **products and services** section, which includes a comprehensive **database** of biotech companies. **The Biotechnology Information Director**, part of **The World Wide Web Virtual Library** contains over a thousand URLs of companies, research institutes, universities, sources

*Continued on Next Page*



of information and other directories specific to biotechnology, pharmaceutical development and related fields. It places emphasis on product development and the delivery of products and services. The sites listed above appear to be the best places to begin should anyone wish to take on the task of exhaustively pursuing references in the GMO field. These too quickly lead one out of any specific field of expertise into another. **EC**

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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# V I E W P O I N T

Kevin Roberts

The NHB performed valuable services for us as beekeepers during the last 14 years. We desperately need a progressive marketing board for domestic honey; a staff of people; an organization that can collect and disburse funds for domestic beekeeping and honey research; a group that can keep the importance of beekeeping to the U.S. economy in front of people in the general press. I believe that it is time to form a new Board, one that is specifically constituted to represent us, the American beekeeping industry. To do this we need to shift the focus of the new Board away from just honey promotion, and instead design it to improve the economic health of all members of the beekeeping industry, commercial pollinators and queen and package producers.

The reasons we need a new and different Board have mostly been brought to light during the past year, so I'll just summarize the reasons we need a Board:

1. **The NHB represented the commodity, not the producers.**
2. **Only those beekeepers who produced honey were assessed, and promotion and research programs focused only on honey.**
3. **Generic promotion sanctioned the image of honey as a mundane baking ingredient, and ignored the potential of regional, seasonal, and floral honey varieties for expanding a gourmet market.**
4. **NHB activities, research, and promotion focused on increasing retail sales of packed honey, and ignored commercial producers who sell their product in bulk.**
5. **Assessing imported honey, and including importers and packers on the Board of Directors diluted the voice of domestic producers in setting policy and goals.**

In short, the NHB was set up to focus all its time and efforts on a single item - honey, irrespective of origin - and therefore neglected the domestic beekeeping industry whose producer members were crashing in flames even as consumption was said to rise. Because of the original mission and explicit structure of the NHB, it could do little else. It's time

for a change, and with some work, we can do better this time.

The new Board should represent and promote the American beekeeping industry, not just the honey industry, not just honey, or just honey producers. It should be funded by an assessment on gross beekeeping income, including other hive products, crop pollination, queen and package production, and producer-packaging, spreading the financial load on everybody, and permit promotion, marketing, and research programs to cover these other aspects of many beekeepers' businesses.

We need specific plans to be able to tackle this job, and the place to start is on those items the NHB has been unwilling or unable to address. These are the initial goals I think we start our new Board on first:

**Labeling varieties** - We can take our cue here from the wine and cheese producers. In my grocery store, there are dozens of radically different types of wine and cheeses. They differ in taste, smell, and color, and are priced according to quality, scarcity, and fashion. Wine closely parallels honey in that the different kinds are determined by region and by the varieties of plants used to make it. We can do the same with honey. How many of you had people ask you for Tupelo honey after it was featured in the movie "Ulee's Gold?"

**Gourmet promotion of varietals** - This has been done successfully with many products, including wines, and more recently specialty beers. I would be delighted if local honey consumption was as high as that of the obscure deli cheeses I see sold for six or seven dollars per pound.

**Labeling honey by proportional country of origin** - For better or worse, we no longer believe that our own products are better just because they're American. But it's a fact many people do prefer to buy American products when they have the choice, and are surprised and disappointed when I show them that much of the honey on the store shelf is imported.

**Honey bear logo ads** - We should bring back the discontinued NHB service mark program, in which we licensed food manufacturers to dis-

play the NHB honey bear logo if they use mostly honey as their product" sweetener.

**Health** - In New Zealand, beekeepers sell high-antibacterial manuka honey for US\$10 per pound, and in Australia, jelly-bush honey is sold in squeeze tubes as an anti-septic. If American varieties can be shown to be similar, then we may have something that can benefit the American beekeeper. But if it just opens up a new domestic market solely for imported varieties, then we will have wasted our money and time. It's up to us to pay for the research into our own honey, and we should use the new Board to continue that work.

**Drum sales and Co-ops** - As beekeepers, we need to find other ways to sell our own honey in drums. For years, the NHB concentrated only on the packed-honey business and ignored the majority of commercial beekeepers who sell their product wholesale. Not everybody has the manpower or infrastructure to pack their own honey, but there is a drum-honey market available to them in bakeries, smaller soft-drink manufacturers, breweries, wineries, candy companies, exporters, and other intermediate-volume users. The new Board can spend some resources helping beekeepers develop and cater to this market.

**The importance of crop pollination to the U.S. economy** - The NHB funded the updated paper "The Value of Honey Bees as Pollinators of U.S. Crops in 2000," showing that beekeepers added \$14.6 billion annually to the national economy in terms of improved crop pollination. This is priceless PR, but so far that information has been pitched mostly at beekeepers, who already know it. Let's get that information out there in front of the non-beekeepers and use it to build a better public image of who we are and what we do.

Beekeeping is hard enough already, but a new Honey Board could help make American beekeeping more secure and profitable. **BC**

*Kevin Roberts is a commercial beekeeper from Los Banos, CA.*



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# Storing Stuff

*The lowly Bee Equipment Storage Barn – never good enough. Never appreciated enough.*

James E. Tew

It is hard Winter now. Remember all those people like me telling you in previous articles to spend the Winter months reading, assembling and preparing for next Spring? Well, now is the time read, assemble and repair. But I ask, "Who wants to work on a snowy day in a cold, drab storage barn?" Much can be done to alleviate this situation – no matter where you must store your equipment.

A major digression on storage barns, if I may. With the support of the state beekeepers and the state beekeeping group, I have the good fortune to work in a modest, but comfortable beekeeping laboratory at Ohio State. The facility was built as a beekeeping lab and serves that function nicely. However, when the bee lab was built in 1985, I was instructed *not to include any storage space within the lab*. Why spend major money on laboratory storage space when a larger lab could be constructed and a pole barn put up for storage? Sounded good to me. The lab was ultimately finished. We celebrated, moved in, began to do bee tasks and waited for the storage barn to materialize. However, the economy turned sour and state money tightened. The barn was put on hold indefinitely. The bee storage barn saga in my life was about to begin.

## **Barn #1**

I was given shared space in a university barn with several other commodity programs. We were immediately bad neighbors. Robber bees, by the thousands, spent much of the Summer bumming around the barn and generally causing panic

among my non-beekeeping peers. We were promised a barn as soon as possible and asked to move to an abandoned farmhouse on one of the university farms.

## **Barn #2**

The house had no electricity, no water, and was inconveniently located. Then the groundhogs and raccoons moved in. What an immediate mess. It was dark inside with vermin running around. We lasted about a year. I chose my time carefully and asked for something else.

## **Barn #3**

Our third barn was an abandoned pig nursery, a long, low and wide building. At the time, little did

I know that the pig barn paradigm was the beginning of a trend for me. The bee lab technician, Dave, went through the horrendous task of pressure washing the entire barn. Barn #3 was an improvement over the other storage buildings, but the widest door was hardly 2½ ft wide, was low and rain water tended to accumulate inside. However, we had potable water, electricity and an aroma – or should I call it an ambience? Then the groundhogs and raccoons moved in (again). What a mess (again). My assignment with the university changed, and I was asked to move to another, larger pig barn in a different administrative unit.

*Continued on Next Page*

*Our current storage barn. The wing was to be demolished.*







Part of the Saw Room

**Barn #4**

You know the routine by now. Moving, washing, cleaning, organizing. Yes to raccoons and groundhogs and mice. But this was a stout, gigantic building. We rattled around in it. However, barn #4 had a unique problem. Under the right conditions of humidity and rain, major amounts of water would condense on the inside walls and ceiling. It would literally rain within the building. Things got moldy and our attitudes began to degenerate. Though initially looking good as a storage unit, after a couple of years, it was clear that this barn was not working as a bee equipment storage facility. I pleaded my case with my bosses and was given barn #5.

**Barn #5**

Hallelujah! Blue skies! Fifteen years after the bee lab was constructed, I seemed to have finally

gotten a barn that appears perfect for us. Barn #5 is near the bee lab, has running water – hot and cold, phone, restroom, abundant space, and incredibly – part of it was heated with a dependable heater. The only problem with this unit was that more than half of it was slated to be razed due to roof problems. Upon learning of this plan, I frantically turned to Ohio beekeepers and to the Ohio State Beekeepers' Association. They came through by buying an \$8,000 roof for the part that was

**Bee Storage Barn Expertise**

If nothing else, I have gained a significant background in bee equipment storage barns. I realize that many of you use the corner of a garage or whatever is at hand, but if you could build something specific for storage, what should you want?

**Storage Barn Characteristics**

The minimal storage barn should have a cement floor and electricity. It should have doors wide enough to easily maneuver a hand truck

*A special rack built to hold queen excluders.*



to be demolished. All the building was saved. (Thanks again to all who helped save it.)

If you come to visit us, I doubt that the storage barn will be on the tour circuit, but it is a major part of our operation and we are elated to have it.

around. It should be clean and organized. Expect mice in any bee storage barn.

The ideal storage barn would have hot and cold water, heated areas and a loading dock. If there are sewers available, the drains should be large enough to withstand wax residue. A woodworking area separated from the general storage area would be common. All windows and doors should be screened. Since an assortment of tools will be needed, the building should be securable. It should be well-lighted, and the ceilings should be high enough that exploring bees are not right at your head.

Beekeeping equipment is inherently messy. Equipment to be repaired; equipment to be assembled; equipment to be discarded – parts and pieces are all over the place. Shelves should be everywhere. Sections of the storage barn should be allocated to specific equipment types.

An area designated for painting is a great feature. With all the edges



*The "Paint Room" in the bee barn.*



requiring coating, painting bee boxes can be clumsy. Equipment will need to be scraped clean of propolis, wax and old paint. I know of no easy way to do this job.

Wax and propolis will accumulate on the floors but can be readily scraped from a smooth cement floor. Large shop vacuums are always handy.

### Ventilation

As cold as the barn can be during Winter months, it can be unbearably hot during Summer months. Roof ventilators or barn fans are a great feature and can actually help draw robber bees from the building.

### Washing the Building

Though the storage barn does not have the same regulations that a honey processing facility has, nonetheless, it should be kept clean. Being able to wash floors and walls periodically is especially desirable. I mentioned sewer connections earlier. Wax and propolis are insoluble in water and will plug common drains. A wide, cleanable drainage system is great. Although it is a real luxury, a restroom in the barn is of obvious advantage.

### What Can Go Wrong?

Even in the best facility, you can expect problems. I have found the following problem characteristic in all our bee storage barns.

**Mice** Mice and stored equipment usually go hand in hand. Mice seem to be in mouse heaven when they find pollen, honey and dead bees to munch on. We have traps set all around and occasionally use poison baits. However, remember that the supers are human food containers and should not come in contact with poisons of any kind. Even so, mice are obnoxious, and the consuming public expects you to do something.

**Robber Bees** Even with door and window screens on most windows, during nectar dearth months, robbers by the thousands get into the building and accumulate on the windows. They also die by the thousands and stink as they decay. I know that traps can be devised to allow the bees to escape from windows, but released bees seem to simply return and the cycle perpetuates

*The Nucleus Hive Department.*



itself.

**Other Insects** Wax moths, ants, silverfish, and in the southern United States cockroaches and earwigs are all routine insect pests. Due to the concerns of using poisons around honeycombs, it may be simpler to live with the insect pests than to declare all-out war.

**Fire Hazards** With all the wax, propolis and woodenware, a bee barn can make a hot fire. Many commercial operations separate storage barns and wax rendering operations from the extracting plant. Have fire extinguishers readily available. Fire hazards are another reason to keep the place tidy. Be certain all electrical wiring meets local codes.

**Wax on the Floors** No matter how nice the facility, wax particles will accumulate on the floors. Either scrape them up or pressure wash them up periodically. There is no way to stop this buildup.

**Characteristic Odors** I don't know what gives the storage barn its unique bee odor. I suppose it is a combination of wax, propolis, PDB, fermenting honey, smokers, decaying bees and old wood. Even so, occasionally a non-beekeeper will comment on the musty odor in the building. Nothing you can do.

**Animal Intruders** As I have lamented earlier, groundhogs, raccoons and mice commonly invade our storage barns and leave their excrement marks. We have had the occasional cat also. I suspect skunks have visited some of you, but thank-

fully, I have not had that happen. Ironically, raccoons are state-regulated animals and simply sending them to their afterlife reward violates Ohio state game and fish laws. However, my concerns for filth, dander and rabies require that I do something to keep the building animal-free. Game wardens can be called in to remove regulated animals.

Asking to visit a beekeeper's storage facility is akin to asking to tour his basement or look in his sock drawer. Try as we might, those of us with several hundred hives must constantly fight clutter and disorganization within the barn.

Some of you have commented that I tend to occasionally philosophize about beekeeping in these pieces. I suppose I do. As I was taking the photos included in this article, it was a cold December day. Everywhere was 'bee stuff.' Last season's honey supers showing promise of next Spring's crop. Old equipment that will probably never be used again sitting in dusty, ignored piles. Unused observation hives with a few dead bees on the bottom. And everywhere the smell of the bee barn. I liked it. Many years of beekeeping memories were melded into one big pleasant memory. Though rarely discussed, bee equipment storage barns are an integral part of our beekeeping operations. Try to make yours a enjoyable area. ☐

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*Finding*

# HYGIENIC BEHAVIOR

*You can't do this without knowing the fundamentals.  
Here they are.*

Steve Taber

Last month I left you hanging as to how I solved the problem of finding hygienic (HYG) bees. Sorry about that. With my feet propped on the desk and my coffee hot, I began remembering that in population genetics the different genes affecting the same locus on the chromosome would have a relative constant frequency in the whole population. What that translates down to is the fact that the HYG genes would be in ANY bee population, and all I had to do was go look for them, which I did.

We had at that time at the Tucson bee lab a number of bee colonies. From these colonies, I cut pieces of sealed brood, about 2 by 2 inches, or 4 square inches (25 sq cm), put them into the freezer to kill the brood, took them out the next day and inserted them into the center of the brood nests of laboratory colonies. I repeated this for a number of days until I had about 30 colonies under test.

These tests were done about 1975. I don't remember how many colonies (queens) tested HYG and how many did not, but about four of them had dead brood all cleaned out in 48 hours. Of course at that time I had no experience with HYG stock, but I knew some decisions had to be made. I would have preferred to have bees that cleaned out the dead brood in 24 hours, but none did. The vast majority of the bees (queens) had not removed the dead brood even after six days. I made the decision then to call a queen HYG if the dead brood was removed in 48 hours or less. If any dead brood remained in the comb after 48 hours, the queen was called non-HYG.

That, unfortunately, presents a quandary today. If you have HYG queens in your apiary and you decide to test them for resistance to AFB, the bees will succumb to the disease, not badly, not like it will kill the colony, but you will see AFB scales in the brood nest. This has prompted me to say there are two classes of HYG queens, one that will remove all dead brood in 48 hours and a second that will remove all dead brood in 24 hours. It has been my experience that those bees and their queen who clean up all dead brood in 24 hours will be resistant to AFB and chalkbrood.

However, when I consulted with Dr. Walter Rothenbuhler about 20 years ago on this problem, he emphasized that you should always test your breeder queens for resistance to the bacteria that cause AFB even if they show 24-hour cleanup of dead brood. Remember, cleaning up dead brood is not exactly the same as cleaning up AFB.

At this point I knew I would be able to get HYG queens that would clean up all dead brood in 24 hours or less just by using my skills at insemination of virgins reared from a HYG mother to drones from a HYG father. So actually we have 24-hour HYG queens and 48-hour HYG queens. The 48-hour HYG queens show resistance to chalkbrood, but only the 24-hour HYG queens show resistance to AFB.

Now you, the average good beekeeper (and certainly those queen producers reading this) who is generally not trained in AI or genetics – how do you go about getting all your stock to be 24-hour HYG? Actually,

it is pretty easy; time-consuming, yes, but not difficult. There are several different approaches to get your bees all 24-hour HYG. If you have already surveyed your colonies and have found two or more colonies that are 48-hour HYG, raise daughter queens from them, let them mate naturally and requeen all your stock. The following year, you do the same thing. Survey all your colonies again to see which are 48-hour HYG. Then you do this again, but now you should examine the test samples at 24 hours to see if you have any queens that are 24-hour HYG.

From my experience with this, I would think if you are operating an apiary of 30 colonies that on the third requeening and testing program, you might get two that test 24-hour HYG and more than half, say about 17 queens, that test 48-hour HYG. At this point you may want to bring in some new stock from someone else who is selecting for HYG in their stocks. You don't need big colonies to test. You can test them in nucs. Just be sure the bees in the nuc are from that queen. Remember, it will take at least six weeks after your queen has been laying before you can subject her to testing.

If you follow this procedure for four to six years, what you will have accomplished genetically is to change the gene frequency of the genes responsible for HYG in your breeding population. Many years ago, when Walter Rothenbuhler was making his momentous discoveries about the genetics of AFB resistance, he found out there were two genes responsible – one gene for taking off



the seal over the dead bee, the AFB scale, and another for the removal of the scale. Both of these genes are recessive, which means that you have to have a virgin queen carrying both to mate with a drone which also carries both.

Walter's next important contribution was to show that you do not have to introduce the AFB bacteria into the hive, you need only to introduce dead sealed brood to test for these genetic characters. We know the queen mates with a lot of drones, from seven to perhaps 20. Some of those drones will carry both genes, some will carry only one, and some may carry none at all. When the preponderance of drones that mate with the queen carry the HYG genes then the worker bees will show this characteristic when you test them for it.

Obviously, you can move this along much faster by using AI, which will permit you to produce 24-hour HYG queens in one or two generations or you can buy stock that has been inseminated with those selection criteria in mind.

Now I want to present some very

**"Whether you cut out brood, kill them with cold gasses or stick them with pins, you must know the fundamentals."**

old data obtained by Park, Paddock and Pellett dating back to 1935. This full table was presented in the 1975 revised edition of *Hive and Honey Bee* published by Dadant and Sons in the chapter entitled "Genetics and breeding of the honey bee," written by Bud Cale and Walter Rothenbuhler. The table from this publication is "Progress in breeding for resistance to AFB, Modified from Rothenbuhler, 1958."

Year	Number of colonies inoculated	Free of disease at end of season
1935	25	28%
1936	27	33%
1937	114	71%
1938	111	81%
1939	148	92%

For the ensuing 10 years, the percentage of colonies showing re-

sistance to AFB remained about 70% or better. Remember now, these three men tested these colonies with a minimum of 75 scales of the disease AFB, they did not know queens mated with many drones, and they did not use AI in their breeding program. You, an ordinary beekeeper, can do the same or better. **EC**

*For those of you who have a large university scientific library available the following reference is useful.*

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

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# The *Varroa* Species Complex

## Identifying *Varroa destructor* and New Strategies of Control

Sue Cobey

*Varroa* on its original host, the Eastern honey bee, *Apis cerana*, is considered an insignificant pest. It did not become a concern to beekeepers until it made the cross species jump to the Western (European) honey bee, *Apis mellifera*. It is an amazing story; how this tiny mite evolved into an independent parasite and become a major pest to spread almost worldwide with such a destructive impact.

Studies in numerous countries of different mite populations on *Apis cerana* and *Apis mellifera* reveal that *Varroa jacobsoni* is actually a complex of two species with significant genetic variation within each species. This discovery is exciting because it explains some of our confusion and provides new clues and new strategies to explore safe and effective solutions. D.L. Anderson and J.W.H. Trueman, authors of the study, describe it as "astonishing" and state it will "radically change" our view of *Varroa*.

One confusing question may be answered; why is *Varroa* reproduction uniform on *A. cerana* yet so variable on its new host? The virulence observed on European colonies in different areas of the world led to the question; are there different types of *Varroa*? In the 1980's studies on the morphology of *Varroa* began. The new tools of the 1990's, DNA sequencing techniques, enabled researchers to explore this question more thoroughly.

The result; *Varroa jacobsoni* as we have know it, has been re-named and re-classified. This mite only reproduces on *A. cerana*. A second species, appropriately given the name *Varroa destructor*, is the one we are familiar with and which infests and reproduces on *A. mellifera*. These are two different species of mites, specialized to parasitize two different species of honey bees. The mites

are reproductively isolated.

### Genetic Diversity

What is remarkable is that within these two *Varroa* species over 18 genetically different strains of mites have been identified, and more are being discovered. Three new types on *A. cerana* in the Philippines and several varieties in India are being studied. These different mites are referred to as "haplotypes" Each haplotype has a distinct mitochondrial DNA sequence. Mitochondrial DNA is inherited maternally (from the mother not the father) and is used as a genetic marker to indicate origin and evolution. A haplotype is the particular combination of alleles in a defined region of the chromosome. In effect, it is a miniature genotype.

The species *Varroa jacobsoni* consists of 9 haplotypes. These are from Malaysia, Indonesia and Java. They are also different in appearance; smaller in size and more spherical in shape than mites infesting European honey bees.

The newly named species, *Varroa destructor*, consists of 6 haplotype from mainland Asia. Of mites in the 32 countries sampled only two haplotypes were found to be pests of *A. mellifera*. These are the only ones to make the host shift. One is referred to as the Korean or Russian haplotype, the other as the Japan or Thailand haplotype. The Korean/Russian type is now found in Asia, the Middle East, Europe, North and South America and South Africa. The Japan/Thailand type is found in Japan, Thailand North and South America.

Today, the Korean/Russian haplotype is the most common mite and has spread the most extensively. It is also the most destructive and has developed resistance to several chemical controls. Its adaptability is

impressive. Now more suited to exploit *A. mellifera*, surprisingly it no longer can infest or reproduce on its original host *A. cerana* in Java.

### Behavioral Diversity

Why is *Varroa* a minor pest on *A. cerana* and a very serious pest on *A. mellifera*? The Eastern honey bee has effective defense mechanisms to limit the reproduction and behavior of *Varroa*. Fewer mites reproduce and their offspring have a higher mortality rate. A major factor is that *Varroa* can only reproduce on drone brood. The seasonal occurrence of drones is further limiting. When infestation occurs, additional factors reduce mite levels.

Mites are often trapped and die within the cells. *A. cerana* drone brood has thick cappings and when drones are weakened by mites feeding, the too-thick cap keeps the drones from emerging. Worker bees do not open these infested cells. The workers recognize the infestation and actually seal the central pore, characteristic of drone brood in this species. As a result the cell contents are entombed and the mites die.

Their well developed hygienic and grooming behavior also reduces mite levels. These factors and others act to maintain an equilibrium of a balanced host-parasite relationship. *A. cerana* has had the evolutionary history to develop natural resistance to *Varroa*, first described in Java in 1904. On its adopted host, after introduction of European bees into Asia about 30 years ago, *Varroa* is much more successful. Here it reproduces readily on both worker and drone brood with devastating consequences.

Yet, on *A. mellifera* the impact of mite infestations varies in different regions. In Europe, Asia and North America colonies do not survive without treatment. In tropical and



subtropical regions where the African bee, *Apis mellifera scutellata*, thrives *Varroa* is of little concern. No treatment is necessary or used in Brazil, Paraguay and northern Uruguay.

Introduced into Paraguay about 1970 from Japan, *Varroa* spread throughout South America. Infestations were initially high, but did not routinely kill colonies and within a few years mite levels dropped to be insignificant.

Common traits of African bees have enabled them to adapt quickly to *Varroa*. Their high rate of reproduction, high frequency of swarming and migratory habits are an advantage. Their aggressive hygienic and grooming behaviors and intolerance of pests reduce mite levels. Their shorter development time also limits infestations. The brood of African bees has also been found to be less attractive to *Varroa* compared to the brood of European honey bees.

DeJong and Soares reported that colonies of Italian bees also thrive without treatment in Brazil. This implies that other factors may contribute to maintenance of low mite populations in the tropics.

Climate has an influence. High humidity and high brood nest temperatures have been found to result in low rates of mite reproduction. Another contributing factor may be the strain of mite found in these regions. The less virulent Japan/Thailand haplotype was only found in Brazil until recently.

The inconsistent rate of mite reproduction and infertility on bees in different geographical areas has been identified as a major factor of resistance. Evidence suggests this is due to different types of *Varroa* on different types of bees. The mites are very specialized parasites, dependent upon chemical cues produced by their hosts. A unique chemical signal produced by a certain type of bees affects a specific type of mite. The genetic diversity of mites and bees and how these specific cues affect them may explain the different reproductive rates observed.

These chemical cues called "kairomones" produced by adult bees and brood trigger specific behaviors and may act to stimulate some mites to reproduce and inhibit others. Observations reveal that some mites do not enter brood cells, oth-

## **"The Korean/Russian haplotype is the most destructive, and has developed resistance to most chemicals."**

ers enter but do not reproduce and some do not mate or are infertile.

These and other factors contribute to suppress mite population growth. Once eggs have been laid in a cell, some progeny die or do not mature. Mites are also known to get trapped between the cell wall and cocoon causing starvation and death. The frequencies of these occurrences offer varying levels of resistance.

The mites may also be producing kairomones that are recognized by the bees. This may identify them as pests and contribute to explaining why some bees more actively remove mites from the brood-nest while others do not. Variations in these chemical signals produced by the various types of bees and mites appear to be a major component controlling mite tolerance and susceptibility.

### **The Search For Solutions**

How to control *Varroa*, safely and effectively, is the major concern to beekeepers and a complex question for researchers. Our increasing knowledge, pieced together from numerous studies across the globe, brings us closer to finding solutions. The realization of the genetic diversity of *Varroa* is a major breakthrough.

In the search for answers, we increasingly recognize the limitations and problems associated with chemical use. This parasite continues to develop resistance to our chemical controls as these become more toxic and are used in higher concentrations. Focus has shifted to finding more sustainable solutions through selective breeding. Research has identified and programs have been established to select for various natural honey bee defense mechanisms.

Specific traits known to reduce mite infestation such as hygienic and grooming behavior, occur with less frequency in European bees than in other races. Selection for increased expression of these has

proven to be somewhat effective. It is currently assumed, however, to develop resistance it will require a variety of mechanisms acting in concert for any one race of honey bees to develop true resistance to *Varroa* mites. As researchers identify traits and beekeepers include these in their selection criteria, we move closer toward this goal.

The use of kairomones offers a promising and effective new strategy. This may be the reason why only two of the many different *Varroa* haplotypes exploit European honey bees. Understanding the chemical ecology of bee and mite interactions, why certain behaviors occur and if these are heritable traits of bees, will be significant. Identifying (and then producing) specific kairomones that can be used to slow or prevent mite reproduction may be the answer for which we have been searching.

Work by J.Harbo and J.Harris suggest that selection for resistance involves three major factors; suppress mite reproduction, hygienic behavior and the tendency of mites not to enter brood cells. The effects of kairomones are a likely component of these behaviors. This also appears to be a heritable trait we can select.

Applying natural selection pressure on the bees to develop traits conferring resistance, as exists between *A.cerana*, *A. mellifera scutellata*, and *Varroa* is critical. The use of chemical controls eliminates this process and inadvertently propagates susceptible bees. Left alone, the natural tendency is to develop a balanced host - parasite relationship. The large, unmanaged gene pool of African bees in Brazil is a prime example. Man's disruption of this and his widespread movement of bees has created the problem. We must now reverse this situation.

*Varroa* will never be eliminated as a pest. New discoveries are encouraging and lead us closer to the goal of being able to naturally maintain mites at insignificant levels. Strategies to develop less virulent

*Continued on Next Page*



## Characteristics Of Various *Varroa* Haplotypes

Haplotype	Synonyms	Natural parasite of <i>A. cerana</i> (location)	Infests and reproduces on <i>A. mellifera</i> (location)	Species*
Korea	Russian genotype (14) R genotype (13) GER genotype (4)	Korea	Europe, Middle East, South Africa, Asia, North and South America	<i>V. destructor</i>
Japan/Thailand	Japan genotype (14) J genotype (13)	Japan and Thailand	Japan, Thailand, North and South America	<i>V. destructor</i>
Java	PNG genotype (4)	Indonesia (Java, Sulawesi, Timor, Irian Jaya), Papua New Guinea	Does not reproduce on <i>A. mellifera</i>	<i>V. jacobsoni</i>

Anderson, D.L. 2000. *Variation in the parasitic bee mite Varroa Jacobsoni* Oud. *Apidologie* 30:183-196

mites and more resistant bees are necessary. This focus must be on selective breeding. We now have the knowledge to move forward in this direction.

We must also be aware that the struggle for conquest in the host-parasite relationship will continue. The mites have demonstrated an impressive ability to adapt to changes in their hosts. They will continue to develop counter measures to honey bee defense mechanisms in the struggle for survival and dominance. The two *V. destructor* haplotypes found to co-exist in the U.S. are expected to interbreed. This ability is a concern and an unknown.

To select and maintain mite resistant honey bee stocks is the beekeeper's biggest challenge, ever. This will require the combined effort of scientists and beekeepers. The search to identify the mechanisms involved, their potential to reduce mite levels, if these are heritable traits, and the mode of inheritance, is essential knowledge. Beekeepers must then take the responsibility to establish selective breeding programs and apply this knowledge in the field. As we discover new strategies and achieve this goal, we must also remember not to become complacent. Selective breeding is an on-going endeavor and subject to constant change. ☐

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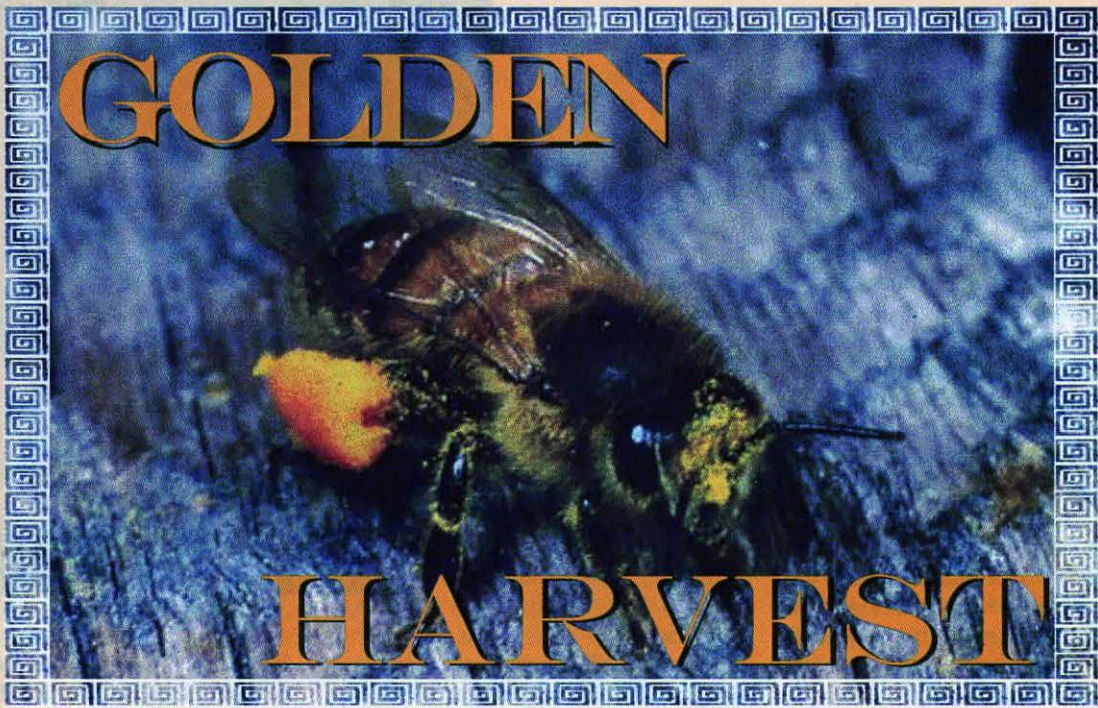
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# HARVEST

There is much magic in this world. Mighty redwoods and oak trees growing from tiny seeds. Sunrises and sunsets. Cygnets becoming swans. Pollen is magic, too, its use by honey bees and its value to beekeepers. In a series of articles, we are going to explore what makes pollen such a wondrous substance and how you can use its attributes for an annual harvest to increase both the joy of beekeeping and the annual income from your work. We will explore pollen's use as a food, how you can collect, clean and store pollen, and how it can be packaged and marketed. As part of the discussion, we will consider the dangers of pesticides as well as the advantages and disadvantages of the various pollen traps presently offered for sale.

Pollen is produced by plants to fertilize the ovum (egg) of the species to produce seeds. Some plants produce pollen that is spread by the wind, while others rely on insects (including honey bees), birds, bats and small mammals to transport pollen. These plants compete with one another and with other food sources (including nectar) to attract pollen-carrying organisms, and in so doing attempt to make their pollen more attractive than alternatives. Consequently, pollen comes in

a wondrous variety of colors, scents and nutritional values (which at least some of the organisms can detect).

In this article I will describe the nutritional value of various pollens and compare those values with other human food and will discuss how you can enhance the health, and thus the value, of your bees by judicious feeding of pollen.

Proteins are necessary for the proper growth and development of all animals, including humans and insects. Honey bees are no exception, and they receive their protein almost wholly from pollen, which also provides them with amino acids, vitamins and fat (nectar is totally lacking in fat). The chart compares some nutrient values of pollen with other common foods:<sup>1</sup>

However, the nutrient value of pollen from individual plant species can vary widely, as demonstrated by the following protein values:<sup>2</sup>

Species:	% Protein	Species:	% Protein
Maple	26.4%	Thistle	18.3%
Blue Aster	34.7%	Almond	30.0%
Creosote Bush	25.8%	Dandelion	14.7%
Pine	7.5%	Cottonwood	16.6%

Dr. Justin Schmidt, a scientist working at the Carl Hayden Bee Research Center in Tucson, Arizona, has made numerous studies and observations of pollen gathering by honey bees, and reports that when given a choice, honey bees collect the pollens containing the highest protein values. This is both amazing and logical, as the result will be fully developed bees with long lives, and most likely to make a maximum contribution to the overall health of the hive.

<sup>1</sup> Excerpted from *Bee Products, Chemical Composition and Application*, by Dr. Justin O. Schmidt, with permission.

<sup>2</sup> Pollen feeding preference of *Apis Mellifera*, by Justin O. Schmidt and Bruce E. Johnson, *The Southwestern Entomologist*, March 1984.

Food	Protein	Fat	Calcium	Sodium	Vitamin A	Overall Rank
Pollen	96.3	19.5	915	179	14500	1
Tomato	50.0	8.8	588	138	41000	2
Cabbage	54.1	8.3	2,037	835	5410	3
Chicken	152.8	35.9	60	484	484	4
Beans	40.1	6.5	443	3,800	1070	5
Bread	43.2	12.3	407	2,200	trace	6
Beef	59.4	82.7	26	145	143	7

The overall food rank, above, includes values for nutrients not shown (potassium, iron, thiamin, riboflavin, niacin and vitamin C) and ranks the values for fat and sodium in reverse order. The values are based on the amount in the quantity of food that provides 1,000 kcal of energy.

Continued on Next Page



Hives benefit greatly from being fed pollen, even in areas where pollen is plentiful. This is especially true in very early Spring, just before or just as natural pollen is being collected. In late winter and early spring, it is not unusual for bees to collect pollen during one or two days of 60-degree temperature, then be confined to the hive for a week or more when a cold front arrives. This can result in expanded brood production during the warm weather, and brood death from starvation (or, and perhaps more likely, bees maturing which will be weak and have short lives as a result of inadequate nutrition) during the cold spell. Often there can be 2-3 or more similar cycles before the weather settles. By feeding, you will be certain that the bees always have adequate nutrition, even when they cannot fly because of cold temperatures.

The best pollen to feed is from your own traps. By definition, it is local, and if your hives are alive and have been productive, you know it is highly nutritious. Next best is pollen purchased from a local beekeeper. If he or she is successful and has kept bees for several years, you can assume that his/her bees are largely or entirely disease-free. Next best is to purchase pollen from a dealer in the area. Ask if the pollen is local. If not, ask if it was produced in the United States or Canada. If the dealer doesn't know or says it was imported, I suggest you look elsewhere, as pollen can carry disease spores. I should say that my reluctance to use imported pollen may be ill-founded.

Essentially, pollen can be successfully collected only from healthy, pesticide- and disease-free hives. I sincerely believe this and will share my logic in another article. Thus, if I had a choice of not feeding or buying pollen that was produced in British Columbia or Michigan (I am in New York), I would buy the pollen. What difference would it make if the pollen were produced in China (the source for almost all commercial quantities of imported pollen)? Perhaps none, but I still wouldn't use it for my hives.

If you don't have and don't want to buy enough pollen, consider mixing the pollen you do have with one of the commercially available supplements. I understand that a mixture of as little as 15% pollen (by volume or weight) to supplement will greatly enhance the supplement's value and attraction.

The two commercially produced supplements are Brood Builder™ by Dadant and Bee Pro™ by Mann Lake. Obviously, the higher the percentage of pollen, the better. First, mix the supplement and pollen dry, then add sugar water as described below.

Bees will not readily take dry pollen, so it is best to mix it with sugar water. Dissolve a measure of sugar into a ½ measure of boiling water. I.e., dissolve four cups of sugar into two cups of boiling water, or dissolve a pound of sugar into ½ pound of boiling water. When cool, add pollen to form a patty about the consistency of bread or pizza dough. Stiffer is better than more liquid. If uncertain, start by adding some of the liquid to the pollen or pollen plus supplement and stirring and kneading. If you have to throw out some syrup, it is inexpensive and not a big deal. When the patties are the right consistency, you will have used about equal amounts (by weight or volume) of sugar syrup to pollen or pollen plus supplement. When your mixture is the right consistency, form it into patties about ½-inch thick. I make up several patties at a time, each weighing about 8 ounces. I pile them on top of each other, separated by wax paper, put them in a container with a cover or in a plastic bag, and freeze. They will keep for months, and I remove them just before putting them on the hives.

Put one patty on each hive, immediately on top of the cluster. If the bees are not right up to the top

*Dandelion*



*Sycamore*





bars, and you have a two-story hive, tip up the top hive body and put the patty on the top bars of the lower body, even if this means that some of the cluster is in each body. I place the patty so the mixture is down and leave the wax paper on top, only because that is faster than removing it. The bees will take the wax paper out of the hive. Once you start feeding, replace the patty when it is gone if the weather is unsettled or is likely, based on past weather experience in your area, to be unsettled. The bees have used the pollen you gave them to expand their brood area, and you don't want them starving because they can't get out to get more pollen.

When the weather becomes settled, watch your hives carefully, particularly if this is your first year of feeding pollen. **YOUR HIVES WILL BE MUCH STRONGER THAN IN PAST YEARS, AND MORE LIKELY TO SWARM!** Get your supers on early, well before dandelion flow, and/or make splits. You don't want the benefit of all your feeding to end up hanging in trees.

Pollen is so good for bees that it must be good for humans! Right? Well probably. The important thing, from the viewpoint of the beekeeper looking for some added income is that there is a widespread

assumption that pollen is a wonder food. People eat it as is, sprinkled on cereal, mixed in cookie dough and in every other manner. It is widely sold in health food stores, at prices that make beekeepers drool. (It was widely reported that Ronald Reagan ate several tablespoons a day.) In 1984 the Food and Drug Administration (FDA) published an article titled "Bee Pollen Great Food - for Bees" and said, "Under the law, since pollen has not been shown to be harmful other than to those suffering allergy, bee pollen may be marketed as a food, provided no nutrition or therapeutic claims are made or implied regarding it. Thus, if the labeling (including pamphlets or advertising associated with the product) does not suggest that it is intended for use other than food, bee pollen marketed as a food need only meet the same general labeling requirements as other foods, and be prepared, packed and held in a sanitary manner." To the best of my knowledge, the FDA has not further defined such terms as "prepared, packed and held in a sanitary manner."

The *only* way I have seen pollen marketed to consumers is in a clear glass or plastic jar, with a label listing the name of the seller and the

weight. No "instructions for use" or claimed benefits. But, rest assured, those consumers who are tuned into the world of natural foods and supplements *know* that pollen is a good thing and how to consume it, and are willing to pay very good prices for pollen from sources local to them.

I recently attended a meeting of the Ohio State Beekeepers Association, and the moderator asked (1) how many collected pollen and sold it retail and, (2) the retail price per pound. Out of perhaps 70 beekeepers present, six raised their hands. The reported selling price per pound was \$7 to \$11, and beekeepers reported collecting 10 to 20 pounds per hive! Personally, I am not set up to sell retail, so I wholesale all my excess pollen in 5-gallon pails (which hold about 30 pounds) for \$3.50 to \$4.50 a pound. *American Bee Journal* recently reported nationwide per pound wholesale prices ranging from \$3.50 to \$6 and retail prices ranging from \$6 to \$15. To beekeepers, this is "money lying in the street" and should be taken advantage of. More next month. **BC**

*Lloyd Spear collects sells pollen in Guilderland, New York. He is the owner of Ross Rounds.*

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# St. Valentine's Day

Ann Harman

February – some of you are sitting by the fire looking at the snow drifts outside; others are taking a stroll, looking for signs of Spring. But one thing all of you have in common is a great opportunity to celebrate Valentine's Day. Everybody has someone to give a Valentine's Day gift to – Granddad, the cute little 5-year-old next door, husband, wife, good friends. Since it is a special day you can certainly take some time out from your busy schedule to make something with honey.

Candy is the usual gift. The stores are full of boxes of chocolates of all kinds. How about creating your own sweets? A word of warning: Honey candies are frequently a bit sticky. If you make the candies just bite-size, then they do not get handled as much when you eat them. Hence, less sticky fingers. A coating, such as coconut or finely chopped nuts, is a good idea also. Powdered sugar, in general, is not a good coating – it just gets sticky, too.

If you cannot find the little fluted paper holders for individual pieces of candy, you can make them from small pieces of foil. The shiny foil will make a nice presentation. If you are having trouble finding a suitable box in your collection of shoe boxes, you can buy a nice box at a gift shop or greeting card store. You will have to go there anyway to get some Valentine decorations such as red paper hearts, greeting cards and perhaps some red ribbon. A cookie tin will work just as well as a box as long as the tin is not decorated for Christmas. Save that one. You'll need it later in the year. Now for the candy.

## HIGH-ENERGY SNACKS

1/2 cup crunchy peanut butter  
1/4 cup honey  
1/4 cup water  
1/2 cup nonfat dry milk  
1/2 cup raw wheat germ

1/2 cup shredded, unsweetened coconut  
1/2 cup hulled sunflower seeds, raw or toasted  
1/2 cup chopped cashew nuts, raw or toasted  
1/2 cup hulled sesame seeds

In a large bowl, combine all the ingredients, stirring to create a thick, homogeneous mass. Press into a small buttered pan or roll into a log. Wrap and chill, then slice into rounds or cut into squares. Store in airtight containers. Yield about 1-1/2 pounds.

Honey  
Gene Opton

Certainly you can compete with the endless boxes of chocolates. In this next recipe the temperatures for heating and cooling the chocolate are given to preserve the texture of it.

## HONEY FUDGE

1/4 cup nonfat dry milk  
1/4 cup cream cheese, at room temperature  
1/4 cup honey, slightly warmed  
1 tablespoon butter, room temperature  
1/8 teaspoon salt  
6 squares semisweet chocolate  
1/2 cup chopped nuts

Mix together dry milk, cream cheese, honey, butter and salt until smooth. Melt the chocolate over hot water to 130°. Cool to 90°, beating vigorously all the time. Combine the melted chocolate and nuts with the creamed mixture. Spread into a buttered 8-inch square baking pan and let cool. Refrigerate until firm. Cut into squares to serve.

The Honey Kitchen  
ed. By Dadant & Sons

Perhaps you would like to give some cookies, either with or without the candy. It would be appropriate to have a heart-shaped cookie cutter for the first recipe. Your cookies can be wrapped, several at a time, in the pink-colored cling wrap. You can fasten the bundles with a white bow. A small box with several stacks of wrapped cookies will look very nice.

## HONEY CRISPS

1/2 cup butter  
1/2 cup honey  
1-3/4 cups flour  
1 teaspoon soda  
1/2 teaspoon cinnamon  
1/4 teaspoon ground cloves  
1/3 cup wheat germ

Cream butter in large mixing bowl. Continue mixing while adding honey in a fine stream. Combine dry ingredients. Mix in wheat germ and add to creamed mixture. Chill for about one hour. Roll out on lightly floured board to about 1/8-inch thickness. Cut with floured cookie cutter. Place on greased cookie sheet. Bake at 350° about 8-10 minutes.

Maryland State Beekeepers Association

I am certain that some of you still insist you have no time. Well, how about making some brownies? There are two wonderful aromas that can come from a kitchen – that of bread baking and that of brownies baking. You can either wrap the brownies with the colored cling wrap or make a foil holder for each piece.

## WALNUT HONEY BROWNIES

2 ounces chocolate  
1/4 cup butter  
3/4 cup honey  
2 eggs, well beaten  
1/2 cup flour  
1/4 teaspoon baking powder  
1 teaspoon vanilla  
1 cup chopped walnuts

Melt chocolate and butter together; mix in honey. Stir into eggs; mix well. Sift together flour and baking powder; combine with chocolate mixture. Add vanilla and walnuts. Pour into a well-greased 9 x 11-inch pan. Bake for 45 minutes at 300°. May be iced with a thin layer of chocolate frosting before cutting into squares.

Nature's Gold Treasure Honey  
Cookbook  
Joe M. Parkhill

There's absolutely no reason why you can't extend this project into a moneymaking one. Create Valentine gift boxes and sell these to your gift-box customers. Look for heart-

Continued on Next Page




shaped shallow baskets or use some nice white gift boxes. Find some small, artificial red roses. One of these can be tied onto a squeeze bear as if he were holding it. The bear can occupy a central place in the arrangement.

Unless you have the permits for selling food, you will not be able to put candy or cookies into the gift basket. However, a nice mug decorated with red hearts and a packet of tea makes a simple but effective Valentine's gift basket.

You can use the same arrangement that you used for Christmas gift boxes for Valentine's Day by simply changing the accompanying decorations. Greeting card shops sell all sorts of appropriate items. Visit a fabric shop. These have quite an assortment of fabrics suitable for all occasions - Halloween, Christmas, Valentine's Day, St. Patrick's Day, Fourth of July. If you dress up your honey jars with fabric "hats" over the lids, you can quickly change those hats to match the celebration.

If you have your jars of honey in a gift shop it is very easy to go there and add or change hats. Fashion some elastic-ribbon bows to hold the hats on the jars and simply use the same elastic for whatever the occasion. Gold elastic ribbon is always available at Christmas time, but it will look just fine for the other days. Buy a spool of it and keep it handy.

Enjoy Valentine's Day - make some fudge for yourself. 

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

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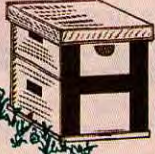
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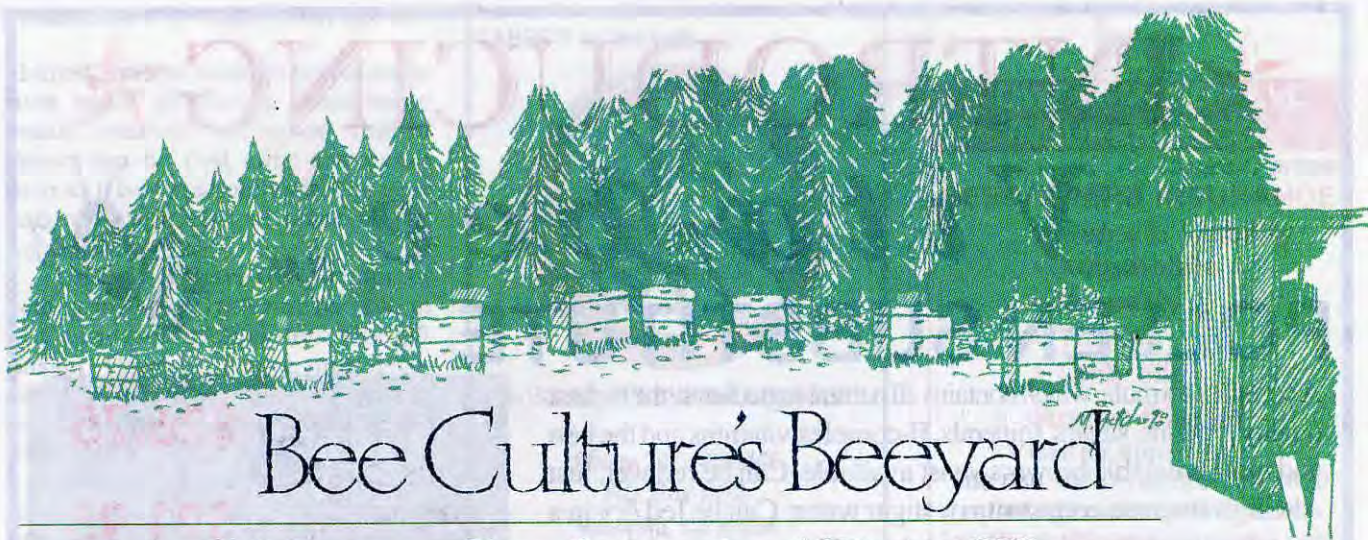
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# Bee Culture's Beeyard

## Winter - Beekeeping's Dead Zone

**Should you have decorated your hives for Christmas?** For me, Christmas 2000 is still a few days away. For you, it has already past. Historically, beekeeping has little involvement in the Christmas season. Considering religious concepts, maybe that is how it should be. Bee veils, beehive appliances, honey and hive products are gifts that I have given to others in the past. Though they were appreciated, these gifts were generally not useful for several months to come. In many ways, giving beekeeping gifts for Christmas is like giving someone water skis in December. You can use some honey in cooking and maybe burn a few beeswax candles, but otherwise, the Christmas season is a dead season for beekeeping. Those of us who have kept bees for a few years are aware of the Winter dead season and have adapted. For those of you new to beekeeping, hang in there. Read, assemble equipment and wait. Spring is not that far away.

**Ice in the BC yard** At this very instant, there are crusted snow and ice in the BC yard. The weather is Winter gloomy and gray. To make things worse, on top of the ice and snow, it is now raining. A freeze is slated for later tonight. All in all, it is not a good day to be in the beeyard. It's an appropriate time to **talk** about beekeeping rather than **do** beekeeping.

**Beekeeping is dying** I was recently told that beekeeping is dying. That it is "rotten to the core." A few

years ago, I became too old to be shocked at such beekeeping statements. At one time or another, I seem to have heard it all before.

In fact, I suspect part of beekeeping is dying - or has already died. Colonial writings describe apple trees on hillsides, having lived full lives, dying and falling over - usually downhill. As each tree fell, it would jam a limb into the ground and a new apple shoot would spring up from the impacted limb of the dying tree. The new tree was somewhat lower down the hill and not quite the same variety as the "grandmother tree" - but a new apple tree nonetheless would evolve from the old. Beekeeping is like an aging apple tree on a hillside. Sometimes beekeeping seems to die and fall over, but something new always springs up.

### Bee Industry Epochs

- (1) **1700-1800.** Bee colonies are wild, and honey hunters occasionally rob honey.
- (2) **1800s.** Bees are essentially farm animals in a farm setting - for personal honey production.
- (3) **1900s.** Bee colonies are for either townspeople or farmers - for personal honey production.
- (4) **1930s.** Beehives are for anyone, whether or not they are landowners. Hobby beekeepers begin to emerge - and honey is for personal use. Commercial equipment manufacturing companies are in full operation.
- (5) **1940s - Present.** Beekeeping is an industry. Full-time beekeepers evolve. Hobby beekeepers

are a major part of the industry. Honey is produced industrially or for personal use.

- (6) **1970s - Present.** While still an industry, beekeeping is now an old craft. Honey is still produced, but enjoyment and relaxation are also important. Within the honey bee industry, pollination increases in importance and recognition. Insecticides are universally bad. Honey begins to be imported in increasing quantities.
- (7) **1984 - Present.** Due to mite predation, honey bees are threatened. General ecological interest increases in beehive management for the "good of the bees." Insecticides are now necessary to control mites.
- (8) **1990 - Present.** Pollination is fundamental. Honey is still produced and in demand. Hobby beekeeping is strong.
- (9) **1995 - Present.** Interest in gardening beekeeping is increasing. Hobby interest and pollination requirements are now fundamental to the industry. Honey production aspect is beleaguered due to imports. Increased use of plastic equipment has softened the demand for beeswax.

**What has died in beekeeping?** We no longer simply find bee colonies in trees and rob them of their honey crops. We have not kept bees in "gums" for many years but now keep bees in commercially manufactured artificial domiciles. Bees are no



longer micro-livestock kept only in rural locations, but are kept by all kinds of people in all kinds of places. Though much honey is still produced for personal use, the average consumer simply buys honey from a store. Such honey is not always produced in this country.

**What is being born in beekeeping?** Pollination is now a major aspect of our bee industry. Incidental people, frequently gardeners, keep bees for their aesthetic value – for some pollination and some honey, but not much of either. Honey is still a prominent part of our industry. Future concerns about honey safety in light of pesticide residues, genetically modified plants and restrictive legislative ordinances loom on the horizon.

We may be farther down the hill, but we have clearly died and sprung up in different forms many times. No doubt, our industry will continue to go through such cycles.

**Now, I've confused myself** Where am I right now? Some of my trees are healthy and growing while other trees are waning. I like beekeeping as a craft, but I also like the modern aspects of beekeeping. I like beehives as a garden fixture. Pollination is an important component of my beekeeping interest. I still eat honey, but no longer feel the passion I once felt for producing tons and tons of it. But I definitely don't think that beekeeping is universally dying. What do you think? Consider your own beekeeping interests now and compare them to your interests in the past.

**Honey, an "antique" food?** I eat fake eggs, fake maple syrup, fake hamburger meat and drink soft drinks sweetened with fake sugar, and I drink milkshakes containing no milk. (Speaking of milk, the changes there are legion, but I'll not go into them.)

It seems to me, that throughout the food industry, honey is standing more and more alone as a pure, unmodified food. I have harped in previous articles about honey not being diversified into different uses – including non-food uses – the way, for instance, soybean products have been diversified. Honey is still, first and foremost, a premier natural sweetener, just as it was in the

1700s. In this special, unaltered food status, it is becoming increasingly isolated. Is that good or bad? As honey increasingly becomes an antique food, will that make it more special as a food, or will it become irrelevant as a food? Which way will the tree fall? I don't know.

**Historical frame of mind** Many of us, especially me, keep bees in part because of beekeeping's great history. Some of us feel a sense of connectedness with beekeepers long gone when we keep our bees. Though plastic frames and foundation are readily available, there are many beekeepers who still install eyelets, wire frames, embed wax foundation and shun all the new expanded polystyrene hive bodies. There's nothing wrong with that, but it's not for all of us.

**Books that may be of interest** If you are of that ilk, there is a reprint of a 1909 book entitled, *Handy Farm Devices and How to Make Them*<sup>1</sup> that may be of interest. The little book has the following chapters: (1) Workshop and Tools, (2) The Steel Square, (3) In and Around the House, (4) Barns and Stock, (5) Poultry and Bees, (6) Garden and Orchard, (7) Field and Wood, (8) Gates and Doors, (9) When We Build, (10) Worth Knowing.

Obviously, the bee section is of interest to beekeepers. Rudimentary plans and instructions are presented for an insulated hive, an excelsior outer cover, a solar wax melter and a friction-top pail feeder. Of more than passing interest, however, are discussions of various small buildings, chicken coops, wheelbarrows, trellises, folding tables and benches, post pullers, rolling gates, door and latch construction and instructions on how to milk kicking cows. This is, by no means, a beekeeping text, but it presents information on old techniques and devices. It is a source of handy information on ancillary devices and buildings for those of you interested in old ways of doing agrarian tasks.

A second, somewhat more recent and more comprehensive book is *Build it Better Yourself*.<sup>2</sup> This nine hundred and forty-one page book is filled with devices, buildings, struc-

tures and procedures on many subjects – including building beehives and a homemade extractor.

As a final warning, neither of these books are bee books, but they do contain beekeeping information. Primarily, these books provide information specific to people who enjoy doing tasks the traditional way. Personally, I enjoy the traditional way some of the time, but the newer ways are here to stay.

**Comments from you** *Tim S. from southeastern PA wrote me.*

In your *Bee Culture* article of December 1999, you mention a frustration with wooden inner covers. Here is a thought for people who like old, wooden inner covers and do not like to see them fall apart. Try using plastic inner covers in warm weather and wooden inner covers in Winter.

In Summer, my bees glue their inner covers to the frames and to the hive bodies. Wooden inner covers eventually are damaged when pried off the hives. In Winter, bees do not do much gluing. Plastic inner covers often warp, and then they may funnel Winter condensation onto the cluster of bees. To get the advantages of both plastic and wood, I use the plastic inner covers in the Summer and the old wooden ones in Winter.

*Dr. Zahir Rawajfih from Jordan e-mailed with questions concerning control of the bee louse (Braula coeca). Within his detailed message, he said,*

"If you know of a way to control the bee louse, I would really appreciate your help in this regard. If you can refer me to a source to buy control chemicals, I will try my best to get them."

Have any of you had problems with bee louse infestations? This louse is commonly found in U.S. hives, but is rarely considered to be a meaningful pest.

Thanks to all who have communicated with me. To those whom I have not yet responded, I apologize. I will try to answer all of you. ☺

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

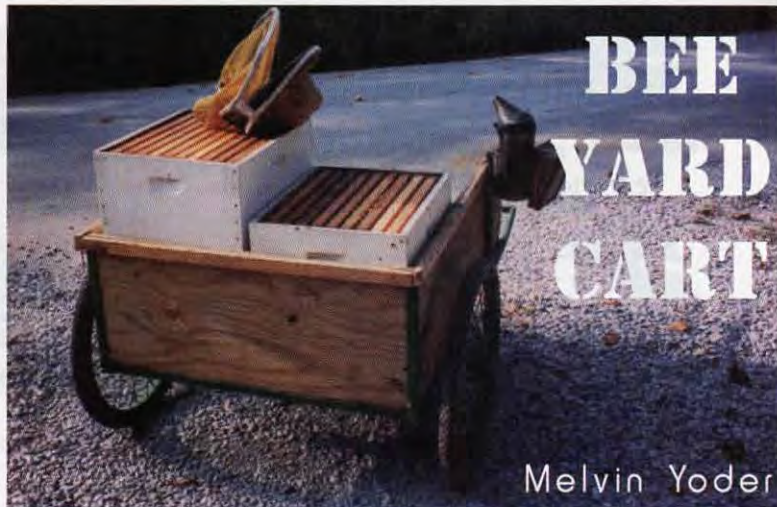
<sup>1</sup> Cobleigh, Rolfe. 1909. (Reprinted 1996 by James R. Babb). *Handy Farm Devices and How to Make Them*. The Lyons Press. New York, NY. 288 pages \$12.95

<sup>2</sup> Hylton, William H., Editor. 1977. *Build It Better Yourself*. Rodale Press, Inc. Emmaus, PA. 941 pp.



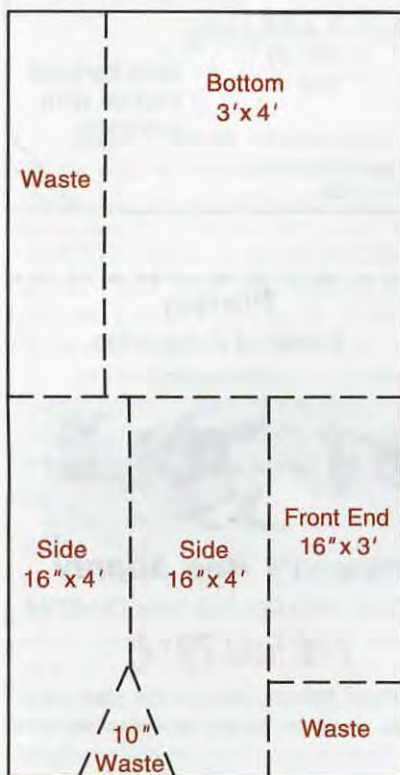
There's no doubt about it, in our day most beekeepers have a pickup truck which they use to take their honey supers and other equipment to and from the apiary, even if they only have one apiary. Still, I can't imagine that I'm the only one who doesn't have a truck or who doesn't want to use it for that or whose apiary is out back a few hundred feet where the truck doesn't go. So how do we get that heavy stuff back and forth? When I had only five hives I got along with using a bicycle trailer (and keeping the grass mowed). But this year when I expanded to 20 hives that little thing was just plain not big enough anymore. I considered getting a lawn and garden cart from Harbor Freight, but

For one thing, I was pretty sure they weren't any too strong. Also, when I compared the size of a hive body with the dimensions of the cart given in the cata-

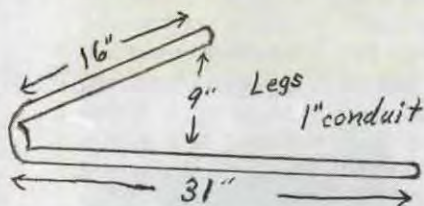


# BEE YARD CART

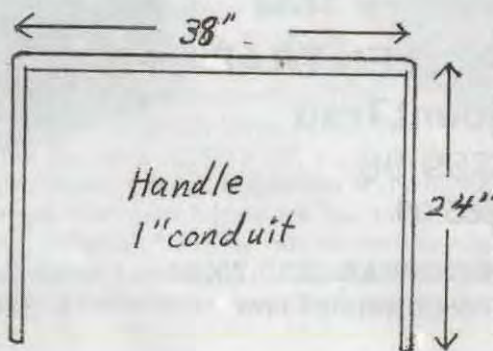
Melvin Yoder



1/2"  
4 x 8 plywood  
(exterior or treated)



We partly flattened the tops of the legs to accommodate the smoker hook.




log I saw very quickly that even their biggest one would not hold what I'd want to haul. But I also saw that one sheet of plywood would be big enough to make one the size I wanted. So with a friend's help, that's what I did. As the pictures show, it's wide enough to put two hive bodies side by side. That allows me to put the heavier weight in front and it's surprisingly easy to haul several hundred pounds on it if there aren't too many hills or chuck holes in the way. After using it for a Summer I neither wish for it to be bigger nor smaller. With a maximum capacity of four shallows and eight deeps I can't imagine anyone wanting it bigger, at least not when you're hauling full supers of honey!



### Material List

- 1 sheet 1/2" pressure treated plywood
- 2 pc. 10' conduit
- 2 wheels
- 20' angle iron (1" or 1 1/2" x 1/8" thick)
- Get at a welding shop or junk yard.
- 10' 3/4" angle iron, lightest available.

I find that having a little bit of weight on the front to counter balance it makes it seem lighter than when it's completely empty.

I think most beekeepers tend to be ingenious and won't have any problem adapting this design according to their needs and the materials they happen to have available. For instance, you could run a 3/4-inch angle iron along the top to protect the top edge of the plywood instead of the one 1 x 2 that we used. You might want to opt for wheels off a mountain bike or motorcycle. (We just used what we happened to have.) The handle could be made from old copper pipe for an old fashioned look, or steel pipe for more strength. I'm only a skinny 125 pounds, so if you're big and strong you might want something heavier and sturdier. Happy trucking! 



# The PACKAGE CHRONICLES

Part 2

Richard Dalby

*Murphy's law applies to packages, too. If it can go wrong, it will, at the worst possible time.*

**May 3, 2000** (Wednesday) – Late afternoon finds me in the apiary. While pulling weeds to clear entrances, I notice a few ants on some of my hives. I locate an ant nest under a piece of old plywood nearby. The diazinon granules I shake on the nest should get rid of the ants in a day or two. Ants are seldom a major problem in this part of the country, but they can distract the bees and disrupt the life of the hive, especially with a small colony. I want nothing to divert my newly installed package colonies from their main objective, which is to increase rapidly in population.

As dusk shades to darkness, a few field bees are still winging back to their hives. Dandelions are still in bloom here and there on lawns, in fields, along roadsides. The nightly weather forecast calls for a week of good weather, with highs near 80°. This is just what my one-week-old package colonies need.

**May 8,** (Monday) – Rain this morning. A cold day. In the afternoon I go to the apiary to check the bees and to feed Bill's sheep, a flock of 15 which are located in a pasture next to the bees. A ram has gotten rambunctious, jumped the fence, and is now grazing among my hives.

After throwing some hay to the sheep on the proper side of the fence, I notice that the errant ram has knocked one of the package hives partially off its concrete block stand. It rests at a precarious angle, almost on its side. This is not good. The hive lid is off, but the burlap inner cover has stayed in place, keeping the rain off the bees. Without a veil I manage to get the hive back together and back on its stand. I try to herd the ram out of the apiary and onto the road, but the other sheep are just across the fence, and he cuts around me and goes back by them. It's the herd instinct in action. I don't want to have the ram running about the apiary, so I go call Bill and tell him the situation. When he shows up in half an hour, we crowd the ram into a corner, where Bill ropes him. (Yes, we do rope sheep on occasion in these parts.) We load the ram into the back of Bill's old truck. It is now almost dark. I make a quick inspection of the other 11 package colonies. Two have lids askew due to the ram, but the rest are okay. Bill and I haul the ram to another nearby pasture where he will not be a problem. I am happy he hadn't caused more mayhem among my hives. The hive knocked awry contained only six frames, and no doubt

they have shifted a bit. I must make certain later that the queen is okay. Sheep are handy to have around to keep the grass and weeds eaten down. But sometimes, as this incident indicates, they are capable of mischief as well.

**May 10,** (Wednesday) – What a difference a day can make. Yesterday's warm summerlike weather is gone, blown away by a cold north wind that brought more rain and much colder temperatures. Tonight the thermometer out on the porch reads 32° right on freezing, and a light, granular snow is falling.

Apple trees are in blossom all over town. Hope they don't freeze. The bees need them for both nectar and pollen.

Now all 12 of my package colonies have either reached or are getting near that critical point in their development, 21 days after hiving, when there is much brood to be fed and kept warm and, as yet, no new bees emerging to help with the work. The unseasonably low temperature tonight certainly doesn't help matters any. All of the package colonies may, at this point, be thinking mutinous thoughts. And those thoughts will be directed against





their queen. They may blame her for their plight – lots of work to do and few bees to do it. Supersedure of the queen may be the next step. So I must check every hive as soon as the weather allows and destroy any supersedure cells I may find. In a week or so, with lots of new bees emerging every day, all thoughts of supersedure will likely be gone. But things are at a critical pass right now, right at that three week point. The last thing I want now is for a hive to do away with one of those beautiful fecund queens. Any break in egg laying now has negative implications concerning a honey crop later in the season.

Yesterday I checked out a black locust tree growing near my apiary. It was loaded with blossoms just ready to open. Unfortunately, the package bee colonies are not anywhere near strong enough as yet to store any surplus honey from this source. Any nectar they gather from these fragrant, pendulous blossoms will all go to feed the burgeoning colony. Well, maybe next year. It seems a long time since I had any of that thick, black locust honey, one of the gourmet honeys of the world.

**May 14, (Sunday)** – Mother's Day. The unseasonably cold weather continued Thursday and Friday, with the temperature down to 30°. Most of the apple blossoms on my trees seem to have survived the frost. Went to the apiary in the afternoon to check things out. Noticed eight to 10 newly removed dead bees on the bottomboard near the entrance

of one hive. Something seemed amiss. The next two hives in the row appeared to be okay. But there on the ground in front of the next hive are perhaps 100 dead bees. And they haven't been dead long from the look of them. Eight of my 12 package colonies look the same, with 100 to 200 bees not long dead littering the ground in front of them. I've seen this before, but not for a long time. My bees have been hit with spray. I remember hearing a spray plane this morning. Farmers have been using a spray plane to kill alfalfa aphids in nearby fields. There must have been some patches of dandelions still in blossom in some of those fields and the bees, my bees, working there got sprayed along with the aphids. Perhaps some of the bees didn't even make it back to the hive. I realize this bee kill was not intentional. Nonetheless, eight of my 12 package colonies now have fewer bees than they had yesterday, and this at a time when every bee counts greatly. Well, today was warm and it will be a warm night, which will help with keeping brood warm.

This spray incident points up the problem with agricultural use of insecticides. The insecticides kill not only destructive insects but also beneficial insects such as honey bees. Farmers should try a new approach such as integrated pest management. I have been told by a farmer friend of mine that local farmers find more aphids on their alfalfa every year.

Yet they continue to rely only on use of insecticides. Like the bee mites, alfalfa aphids and other destructive insects become in time resistant to the chemicals used against them. American farmers have largely adopted a system of monoculture which favors the insect enemies of the plant being grown, whether alfalfa or soybeans or wheat or corn. Integrated pest management seems to be a better answer, for both farmers and beekeepers. Needless to say, I am none too happy with a spray plane killing some of my bees, not to mention all the ladybugs and other beneficial insects that got in the way of that insecticide.

**May 18, (Thursday)** – Another rainy day. The bees are unable to fly to the black locust trees which are white with their beautiful blossoms. Better weather is in the forecast. The temperature is supposed to be back in the 80s come Sunday.

**May 20, (Saturday)** – Wonderful bee weather today, with the temperature near 80 in the afternoon. The bees are working on the black locust blossoms, whose sweet perfume is in the air. It is impossible to know for certain how long these blossoms will last, but at least for today the bees are in heaven.

One of my package colonies has developed laying workers. I know this colony had a laying queen earlier because I checked every one of the package colonies to make certain each queen was there and laying. But a laying worker situation can develop with package bees, for a variety of reasons. This means I now have 11 queenright package colonies instead of 12. Perhaps I should take three or four frames of brood and bees from the strongest of my other 11 hives to start a new colony to make up for this hive with laying workers. I must add more frames as soon as possible to each package colony so the queens have ample room to lay and the worker bees have plenty of space to store honey and pollen. **EC** (To be continued)

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





plications on dumping and the claims that we are all in a global economy and had better get used to it.

There is both a common truth, and a common error in that statement. The truth is that if the corn I grow here in Ohio is identical as a product to the corn grown in Argentina, Brazil, France, China or in Canada, then all corn is the same and there is nothing special about Ohio corn. The only difference is in the price to the person who will purchase that corn, and that price is determined by how much it cost me to produce Ohio corn. After that the only advantage comes down to freight. There's nothing new here. This is pretty elementary stuff. Subtle differences come into play if the corn sellers in one area, say China, sell their corn for less than it costs them to produce and they lose money on the deal, but get the sale. Individuals couldn't do that for long, unless there is some compensation for them from a higher authority, say their federal or state government. If that's the case, if a seller 'dumps' a product into a market (say a country) simply for the sale (either to generate some income because there is none from the home market, to curry favor from a foreign government, or to curry favor from the home government), a yet higher authority, at the international level, is supposed to take over and slap the hands of those doing the dumping (whether individual growers, exporters, or entire governments). This is usually in the form of either extra duties placed on the corn being shipped into the complaining country, or making the offending country stop sending cheap corn altogether. What this does in effect is level the playing field so that those who can produce the cheapest corn will sell the most, all other things being equal. Those who can't compete with the cheap corn, because of higher land, labor or shipping costs will quit producing corn, and begin producing something else they are more competitive at...say soybeans or computer chips. This, then, is the common truth when talking about a global economy.

The common error in this theory, however, is that not all corn, or

honey, is created equal. Let's look at honey.

Several years ago I listened to experts, I read and I studied the informed sources, notably the Honey Board and many packers and importers, and I, too, began to think that all honey, like all corn was treated equal in the global market place. So what they said about competitive advantages seemed to make some sense. If honey could be produced in China, Mexico or Argentina less expensively than in the U.S., then our honey producers should be making computer chips, or flipping burgers somewhere, rather than making honey. Our government, at the time, wasn't compensating beekeepers for the honey they were making, and, moreover, they were saying, essentially, that if you can't make money making honey, and crop growers won't pay you enough for pollination to keep you going, then charge more...or hang it up.

The overriding fact here, however, is the obvious...the honey from China, Argentina and Ohio is not the same. Unlike corn, Argentina cannot produce Ohio wildflower, California star thistle or Maine blueberry. Some U.S. packers, however, seem bound and determined to make that happen. The Honey Board, at the time, was also bound and determined to make that happen. Blend it all together and make it all come out the same. "That's what the customer wants, and that's what we will give them...." Much like LTV steel.

Meanwhile, back on the farm, local customers were still saying *your* honey was the best they ever had....and we kept thinking it was because it hadn't been heated to within an inch of its life, filtered to keep out everything except color and blended to the same shade of yellow it had always been. Well, to some degree (180 degrees, actually), that was true. But more true, it seems, is the fact that you were producing Ohio wildflower, California star thistle and Maine blueberry. Not a generic blend of honeys from China, Argentina or Mexico.

There is currently a lot of talk about the National Honey Board promoting only U.S. honey. The talk centers on the fact that U.S. producers are paying the freight for promoting both the stuff that's coming in from off shore, and the honey pro-

duced in the U.S. But since the honey that's coming in from off shore is either being dumped (that's pretty much been proven), or is being produced in a more efficient (thus lower cost) manner, U.S. honey can't compete in the market place and more and more off shore stuff is being sold. The assumption being (and I use that word with all it's connotations) that all honey, like all corn, is created equal. You and I know it's not. Your customers know it's not. The only people who don't seem to get it are the people who import second rate product, or seem to want to produce a second rate, lowest-common-denominator product. What's wrong with these people, these packers that want it all the same?

All honey is not created equal (actually, mine is a bit better than yours), and if current U.S. sellers don't see that then they haven't been looking, or they haven't paid attention to what they have seen. And, there absolutely will be somebody who will start selling Ohio wildflower, California star thistle and Maine blueberry.

U.S. packers have really missed the boat with this. And they kept the Honey Board from seeing it also, I think. Selling lots and lots of generic honey (whether U.S. or imported) made the Board look good, and put money in Packers' pockets. But it was only a short term gain, and, like LTV, it's time to pay the piper. There's a market for both products in this country, and if those selling honey now don't sieze that opportunity, you *can* bet the farm somebody new will.

It's already too late for very southern beekeepers to begin, but the rest of us have just a tiny window left to get our act together. Sharpen hive tools, wash beesuits, clean smokers, check-out catalogs and get ready. It's gonna be a barn burner this year.





# ?Do You Know?

## Answers

1. **False** Prior to the emergence of a swarm, a small number of bees become highly excited, nervous and appear to initiate emergence from the hive. These bees force their way among the other bees in the colony in zigzag running steps, vibrating their abdomens and producing a perceptible whir with their wings. As more and more bees become involved, the queen is aggressively pushed towards the hive entrance by the worker bees and forced to become part of the impending swarm.
2. **True** In areas where winter conditions cause a break in the brood rearing cycle, young queens lay later in the fall and initiate brood rearing earlier in the spring than older queens.
3. **False** Isolated queens can feed themselves on sugar candy and survive for many weeks, but queens in colonies seldom, if ever, feed themselves.
4. **False** Queen honey bees leave the hive to take orientation flights prior to mating, during the mating flight(s), to participate in swarming and absconding but not to take cleansing flights in the spring. The wastes of the queen are removed by the retinue of workers that forms around her in the broodnest throughout the year.
5. **False** Queens go on their mating flights when the weather is warm, the wind is fairly calm and during the afternoon.
6. **True** The sting of the queen is a modified ovipositor. The sting is curved and the curvature closely approximates the curvature of the egg. In the process of laying an egg, the sting of the queen and the sting palpi form a groove. The egg passes down this groove and is thus held in position momentarily against the bottom of the cell.
7. **True** Since the pheromones produced by the queen are an important component in the social organization of the colony, queenless colonies are more aggressive than queenright colonies. Soon after a queen is removed, many agitated workers (guards) appear at the colony entrance, apparently looking for their lost queen.
8. **False** Virgin queens do not become sexually mature until the fifth or sixth day after emergence.
9. **True** While virgin queens seek out capped queen cells when they emerge, they pay little attention to unsealed queen cells and the worker bees soon discontinue their construction and care.
10. E) 13
11. D) 11
12. E) Two
13. The members of the queen's court face toward the queen, offer food to her, palpate her with their antennae and lick her.
14. Several situations can result in a colony being headed by a drone layer. If a virgin queen has not made a successful mating flight within three to four weeks after emergence, she usually becomes incapable of mating and becomes a drone layer. When the queen's supply of sperm in the spermatheca is depleted she also becomes a drone layer. In addition there are numerous diseases and physiological problems that can prevent the queen from laying fertilized eggs. These problems are often divided into four categories: lack of fertilization, unsatisfactory fertilization, exhaustion of the sperm in old age and pathological drone-laying.
15. Reasons for requeening colonies:
  - A. reduce the swarming tendency
  - B. increase the chances of winter survival
  - C. control of some bee diseases, i.e. European foulbrood, sacbrood
  - D. production of larger forager populations to increase honey yields
  - E. improve colony temperament
16. \*Introduce the queen in a Benton mailing cage and allowing the bees to release her.  
\*Release the queen into a push-in cage that is forced into the face of the comb over a small

area of capped brood.

- \*Introduce the queen into a nucleus colony by one of the above techniques and at a later time, combine the nucleus colony with the queen after she has started laying, into the colony to be requeened.
  - \*Place the queen in some type of protective cage, suspend it into the colony to be requeened and release her in 3 to 4 days.
17. Finding the old queen and killing or removing her from the colony to be requeened.
  18. Honey bee queens are marked for the purpose of: 1) quickly locating them within the colony; 2) recording their age; 3) identifying genetic lines or suppliers and 4) knowing when natural queen replacement or superscedure has occurred.

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 Plant Pathology at Mississippi State University, Mississippi State, MS.*

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Richard Taylor

# Bee Talk

"Partly what attracts people to beekeeping in the first place is the romantic history of the craft."

**A** friend, who has known more beekeepers, far and wide, than I have, recently remarked that beekeepers are like comets. They burn brightly for awhile, then disappear from view.

This got me thinking back over the years about all the beekeepers I have known. Yes, they are indeed like comets, and most of them faded away very quickly and abruptly.

Here is what usually happens. Beekeeping somehow attracts your attention. Perhaps you came across a book about bees, or maybe you remember how your grandfather had bees, or you have a beekeeper friend – whatever. So you get to thinking about it, perhaps do a little day dreaming, a little reading up about bees, and then, before long, you start with a hive. By this time maybe you have gotten all the nice new stuff you will need – the beesuit and veil, smoker, and so on, together with the package of bees that makes your heart swell with the joy of anticipation. Bees turn out to be gentle little creatures. You see them start building their beautiful white new combs, brood appears, the colony flourishes. It is exciting beyond description, and at the end of the season, perhaps with a bit of help, you harvest the honey – honey made by your very own bees.

But then sooner or later – usually pretty early in the game – problems arise. Spring comes and your bees are all dead. Maybe the mites got them. Perhaps you open the hive to find the combs a moldering, smelly mess. Or maybe there is a filthy mouse nest right in the middle of the brood nest. Or perhaps, at the height of the season, you learn that the bees have Foulbrood, and the

whole contents of the hive must be burned, honey and all. Or you suffer a severe episode of stings. Something like that. Now, what was unadulterated excitement and joy, becomes discouragement and depression, and you lose interest.

That general picture is so typical that I long ago stopped encouraging anyone from taking up beekeeping. I practically knew what was going to happen.

Partly what attracts people to beekeeping in the first place is the romantic history of the craft. Beekeepers really are in a class by themselves. If people know you are a beekeeper, then that becomes the most interesting thing about you, no matter what may be your other interests and achievements. Newspaper and magazine articles about individual beekeepers appear regularly, and more often than not, they say more or less the same things. Beekeeping is an endless source of fascination even to those who know nothing about it. I learn this over and over, Summer after Summer, at my honey stand.

A friend of mine, having completed his major in mathematics, found in his senior year at the university that he had room for another course or two in his program. Thumbing through the course catalog he came upon an introductory course in beekeeping which looked interesting, so he signed up for that. Soon he was hooked, and a few years later had earned a doctoral degree in apiculture. His name became known in the circles of honey bee research even before he owned a colony of bees of his own. He then set up an apiary. A couple years later he was hit with American Foulbrood, and all his in-

terest in bees instantly evaporated. He never mentions bees anymore, and doesn't want to talk or even think about them. Still, he will go to his grave with a doctoral degree in apiculture.

For three decades I attended almost every annual meeting of the Eastern Apicultural Society. Some of the faces were familiar from year to year, but there was a constant turnover. Back in the 60s, during a great movement to organic food, lots of young people began turning up at the meetings, but a few years later nearly all of these had left. Then for awhile it was difficult to get young people interested at all. The picture was much the same at local meetings, and remains so. New people turn up, not knowing much about bees but burning with enthusiasm for this new idea, like the comets alluded to earlier, but then, after a few months, they are gone, not to be heard from again.

All this has led me to wonder why it is that some people stay with bees, sometimes for their entire lives, when so many fall by the wayside. And I think I know the answer.

Part of it is temperament. You have to be a certain kind of person to develop a lasting interest in bees. Long, long ago, when war had taken me far from home, I picked up Frank Pellett's *Productive Beekeeping*, and I still remember

the opening chapter, entitled "Who May Keep Bees?" His answer was that you have to be a "naturalist," that is, someone who loves nature. Beekeeping was not then something new to me. But I recognized that the description fit me. Many lifelong beekeepers have this affinity with nature. My great and

Continued on Next Page  
47



ongoing joy, year after year, was being out in the beeyard. I needed nothing more to lift my spirits. Just being with the bees was enough. I have seen this in other old timers too.

The other thing that sustains an interest in beekeeping is finding some additional reward, over and above the sheer fascination with bees. Often this reward is income. You can't get rich keeping bees, but if the pursuit is profitable then you do have an ongoing reward. When you are paid for what you are doing, then you know you are doing something well. One of the finest and happiest beekeepers I know happens to be extremely good at marketing. He has, over time, earned the friendship and trust of lots of customers, and I see honey with his label everywhere honey is sold around here.

And of course there are other rewards that some beekeepers have the talents to claim. Some, for instance, win prizes and recognition at honey shows year after year. I have seen long-time beekeepers who have a whole room full of ribbons and trophies, and each year they look forward to winning a few more. Others find a rewarding outlet in writing about bees, as I did for many years, and in giving courses. I used to do that, but gave it up when I found that almost none of my students, after they got started, stayed with it very long. Some beekeepers, year after year, play important roles in beekeeping clubs, and the recognition of their efforts and skills is an additional satisfaction.

The general picture, though, is the same, and the comparison with the brightly burning but short-lived comet is apt: To be a long-time beekeeper you need more than the enthusiasm with which you plunged into the craft. If your sole interest is just in having some bees, perhaps a hive or two out by the garden, then, no matter how hot your enthusiasm may burn at the beginning, it is a virtual certainty that you will not be a beekeeper for very long. **BC**

*Richard Taylor is a philosopher and lifelong beekeeper who lives in the Finger Lakes region of New York. He is the author of The Joys of Beekeeping.*

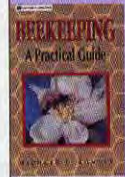
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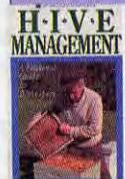
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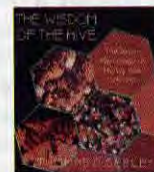
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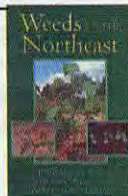
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# GLEANNINGS

FEBRUARY, 2001 • ALL THE NEWS THAT FITS

**None In 2000! Can You Believe It!**

## EAS AWARD NOMINATIONS SOUGHT

The James I. Hambleton Memorial Award was established by the Eastern Apicultural Society of North America to recognize research excellence in apiculture. The EAS Student Apiculture award was established to recognize students studying apiculture at the undergraduate or graduate level in a recognized college or university in the United States or Canada. Each award nomination must include a biographical sketch of the nominee, a list of his/her publications, specific identification of the research work on which the nomination is based and an evaluation and appraisal of the accomplishment of the nominee, especially of work in the last five-year period for Hambleton award nominees (or a shorter period for Student nominees). Two letters of recommendation supporting the nomination are also required.

To begin the millennium, a new EAS professional award will be given annually to recognize an

individual in teaching/extension and/or regulatory activity in the field of apiculture. Nominations for this award are welcome from any person in the field of apiculture or may be self-nominating. Nominations shall consist of a letter documenting the achievement of excellence in any or all of the areas of teaching/extension and/or regulatory activities in apiculture. Some indication of the appointment responsibilities should be included. In addition, a suitable CV or resume documenting the activities of the nominee must be submitted.

Nominations are now being accepted for all three awards. The awards for 2001 will be presented at the annual meeting of the society at Cape Cod, MA, August 6-10, 2001. Nomination and letters of recommendation should be sent to Clarence H. Collison, Box 9775, Mississippi State, MS 39762 and received no later than March 1, 2001.

## APIMONDIA 2001

The beginning of a new millennium brings the first ever APIMONDIA Congress in Africa, October 28 - November 1. The organization of this world Congress in South Africa offers great opportunities for people from all over the world to participate. With excellent connections to South America, South East Asia, Australia and New Zealand, and regular flights to Europe and North America it is guaranteed that this will be a truly global Congress.

South Africa has so much to offer the beekeeping world: To see African bees in their natural environment, the Cape-bee with its special features, and imported bee-races too. Large scale utilization

of bees for pollination and increasing honey production, showing the development from the original "honey hunting" to large scale technology, with related operations adapting to the rapid changes necessary in today's world. The Congress is for everyone in beekeeping: scientist, professional beekeeper, honey trader, development worker and hobby-beekeeper. In addition to these professional activities everybody will have the chance to experience the great tourist opportunities of South Africa.

See the "big five" in their natural environment. I had the experience last month when I was there. I felt humble to face an elephant that close.

*Continued on Next Page*

**Guess What's Next?**

## POSTAGE UP IN '01

The Board of Governors of the U.S. Postal Service in December allowed under protest the overall 4.6 percent postage rate increase recommended by the Postal Rate Commission.

While the board backed the one-cent increase for the price of a first-class stamp, it said other new rates won't raise enough revenue to cover rising costs.

Regardless, the USPS said the rates recommended by the PRC took effect January 7.

"The recommended rates will not provide the revenue requested in January to fund postal service operations and necessary improvements in its infrastructure, and the financial position of the postal service has worsened since the rate filing," board chairman Einar Dhyrkopp said in a statement.

John Potter, USPS chief operating officer, reiterated this point last week at the Graphic Communications Association's 2000 Rate Case Conference in Chicago.

"The major difference of opinion between the postal service's

position on rates and what the rate commission gave back is a matter of money," he said. "If you look at what was rendered, our experts believed that we are going to come up about \$1 billion short in terms of revenue. The rate commission, however, had a much more positive outlook in terms of growth than the postal service does."

Potter said that the USPS lost \$199 million in fiscal year 2000, and for 2001 the USPS' projection - before receiving the PRC's decision - was that "we are going to lose \$480 million. Now with their decision, that projection is likely to be \$1.2 billion."

The average increases for each class of mail are: 1.8 percent for First Class; **9.9 percent for periodicals**; 4.5 percent for regular standard enhanced carrier route; 8.8 percent for all other regular Standard-A mail; 2.7 percent for parcel post; 17.6 percent for bound printed matter; 16 percent for Priority Mail; 7.2 percent for non-profit periodicals; and 4.8 percent for non-profit standard.

## NEW ZOËCON MANAGER

Wellmark International has appointed Scott Boutilier as business manager for its Starbar division, a producer of farm and feed and cattle feed-through products. Boutilier will also manage the apary, and turf and ornamental product lines for Wellmark's Zoëcon Professional Products division.

Previously a project director at Lesco, Inc. Boutilier managed research, product development and marketing for patented fertilizer technologies. He also focused on special projects. Prior to this,

Boutilier worked as a product development manager for Verdant Brands, Minneapolis, and as director of marketing for Lipha Tech Inc., Milwaukee.

Boutilier holds a bachelor of science degree in entomology from the University of Idaho.

Located in Schaumburg, IL, Starbar and Zoëcon are divisions of Wellmark International. Wellmark is a leading producer of chemical and biological products for professional pest control.

*Send Your Notices To Bee Culture*



Durban is in the KwaZulu-Natal province. The Zulus are proud people with a rich culture, that they will present to us.

The Scientific programme will be developed by co-operation between scientists of the South African Organising Committee and the Standing Commissions of APIMONDIA, to ensure that we make a world Congress that reflects the special values of South African scientific development. In the Congress Plenary Sessions, selected keynote speakers will review scientific developments for the beekeepers as well as for fellow scientists.

Genetically modified crops as bee forage, Varroa and the African Bee races, Effects of trade in bees on the spread of pests and diseases, appropriate-technology for professionals and hobby-beekeepers and Honey and its use in self-medication are just a few of the headlines of the programme.

At the Plenary sessions all lectures will be translated into English, German, French and Spanish. Seminars and Workshops will allow the scientists to also have smaller, specialist meetings.

APIEXPO will feature displays by exhibitors from all over the world. Companies interested in making business in Africa, South America, South East Asia, Australia and New Zealand will find the South African Congress very attractive. An important aim of APIMONDIA'S Congresses is to create links between people involved in the beekeeping world. It has always been a definite goal of APIMONDIA to create friendships between people. Receptions, folklore and entertainment will be an integral part of the Congress to ensure that people have good opportunities to meet. The South African people are well known for the hospitality and excellent wines.

I have been asked about security problems in South Africa. When I was there last month I did not feel any discomfort. The congress centre in Durban has recently hosted the worlds AIDS-conference with 11.000 participants without any problems. I look forward to meeting you in South Africa at APIMONDIA 2001.

#### What is APIMONDIA?

APIMONDIA is a world organization of Beekeepers Associations. We work to create links between everybody involved in the Bee-

keeping world. We want to facilitate exchange of information and discussion of new ideas. We want to provide beekeepers, researchers and others involved in Beekeeping with the latest information. We want to promote apicultural scientific, technical and economical development in all countries and the fraternal co-operation of beekeepers associations, scientists and of individual beekeepers all over the world. We want to put into practice every initiative which can contribute efficiently to improving beekeeping practice and which can contribute to make Beekeeping profitable.

APIMONDIA is 103 years old. It started with the first congress in Brussels, 1897. APIMONDIA is one of the oldest NGOs in the world.

We have 54 national beekeepers associations as members. With contacts to many beekeeping journals we represent 5-6 million beekeepers around the world.

The biannual congress is the main meeting point for the beekeepers. The Federation has its general Assembly at the congress. At the congress you will have the chance to meet the members of the APIMONDIA Executive Council to discuss directly with them about your problems.

Asger Sogaard Jørgensen  
President of APIMONDIA  
Møllevvej 15  
DK 4140 Borup, Denmark  
www.apimondia.org  
www.apimondia2001.com

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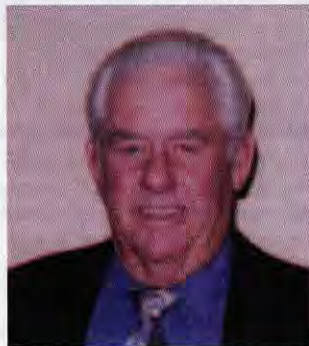
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e-mail: apimondia@mclink.it

## RESEARCH FUNDING AT CA MEETING IN NOV.

The CA State Beekeepers Association has approved funding for three new research projects. The amount allocated for these projects is \$19,000. This money comes from membership dues and the annual auction. Our research committee studies all proposals and decides which are most deserving. If you feel the Association supports worthy projects feel free to donate to the CSBA Research Fund. If you would like to make a proposal for a new project, our Research Committee will study all proposals. This year's awards are as follows: Gloria DeGrandi Hoffman and Gordon Wardell of the Carl Hayden Bee

Research Center in Tucson, AZ to develop a delivery system for plant essential oils that have been effective in controlling chalkbrood and foulbrood. Approved funding \$5,000. Dr. Christine Peng, Dr. Harry Kaya, and Dr. Eric Mussen from the University of CA at Davis for testing of the fungus *Hirsutella thompsonii* as a control for *Varroa* mites. Approved funding \$10,000.

At the same meeting, Charlie Baker, Los Banos was named Lifetime Honorary Beekeeper; Jim Robertson was picked as Beekeeper of the Year, and Brent Barkman, Kansas was given the Distinguished Service Award.



Charlie Baker



Jim Robertson

## OSHA ERGONOMIC STANDARDS

Barring successful court challenges, a new OSHA ergonomic standard went into effect on January 16, 2001. The new standard requires employers to establish job-based ergonomic programs and requires employers to provide employees removed from work due to ergonomic-related injuries with 90% of their pay and 100% of their benefits for 90 days or until they return to work or it is certified that they can never return to their former job.

While general farming is exempt

from this standard, the standard does appear to cover some ag/hort operations, such as nurseries engaged in the wholesale distribution of flowers, nursery stock and florists' supplies; retail nurseries; landscape architects; operations involved in sod laying and turf installation (except artificial); food processors and cotton gins.

For more information, visit Gempler's ALERT <http://www.gemplers.com/scripts/link.asp?src=06W295&page=alsertergo.htm>



## AG DATABASE AVAILABLE

A new searchable database developed by the UC Sustainable Agriculture Research and Education Program (SAREP) is now available to help farmers, ranchers and community food groups craft low-impact solutions to many of the operational questions they're wrestling with today.

Questions such as: What alternative pest control methods are available for a particular commodity and how can they be applied to my farm or ranch? How can I manage my soil to reduce nitrate contamination of the groundwater? What strategies can my community use to strengthen connections with local agriculture? Find out at [www.sarep.ucdavis.edu/grants/database/](http://www.sarep.ucdavis.edu/grants/database/).

"This information contained in the database has been generated from more than 250 research projects we've funded since 1987," says SAREP Director Sean Swezey. "It's great to do research to find more sustainable farming practices, but if growers, farm advisors, pest control advisers and consumers don't know what has been done, it's not much use. We're thrilled to give people this instantly accessible tool to find solutions to the problems they're dealing with."

## OH STATE SPECIALIZED BEEKEEPING SHORT COURSES

**May 10-11** – The art of queen rearing is one of the most pleasurable and rewarding aspects of beekeeping. This class is designed to give the beekeeper an understanding and appreciation of what it takes to rear high quality queens, as a hobby or on a commercial scale.

The basic biology and principals of queen rearing will be presented. Beekeepers will be involved in the various steps of the process including setting up cell builders, grafting, handling queen cells and establishing mating nucs. Two basic queen rearing systems will be demonstrated, a queen right system and a queen less system.

Registration for this class is \$175 and deadling is April 1st.

**June 6-8** – An intensive three-day course on the technique of instrumental insemination and bee breeding is designed for commercial beekeepers who are involved in a breeding program and for laboratory personnel requiring the skill for research purposes.

A practical hands-on approach

Since its inception in 1987, SAREP has funded 263 projects totaling \$6.8 million, addressing topics and questions of importance to farmers, ranchers and communities across California. Projects in the database include both basic and applied research, education and demonstration programs of research-based technologies and systems, and projects that support the development of community food systems and policies that enable farmers to make the transition to more sustainable food and farming systems.

The database can be searched by topic, commodity, research location, relevance to organic farming, and principal investigator. It also has full text search capabilities. The project summaries contain information that will be useful to producers, community groups, researchers, educators and policy makers across the state.

Contact: Sean Swezey, Director, 530.752.2379 or 831.459.4367, [findit@cats.ucsc.edu](mailto:findit@cats.ucsc.edu); David Chaney, Education Coordinator, 530 754 8551, [dechaney@ucdavis.edu](mailto:dechaney@ucdavis.edu); Lyra Halprin, Public Information Representative, 530.752.8664, [lhalprin@ucdavis.edu](mailto:lhalprin@ucdavis.edu)

to instruction is provided with emphasis on individual attention. Participants become familiar with the assembly and alignment of equipment and sterilization methods. Extensive instruction and hands-on practice of semen collection and insemination of queens will be the emphasis facilitated with the use of a video camera and monitor.

Registration is \$350 and deadline is May 15.

**July 26-27** – An intensive two-day course on the technique of instrumental insemination is designed as a follow-up to the Instrumental Insemination course and for beekeepers and researchers with experience who desire to improve their technique.

Registration is \$250 and deadline is June 1.

Classes are taught by Sue Cobey. Make checks to OSU and send to Sue Cobey, Dept of Entomology, 1735 Neil Ave., Columbus, OH 43210, 614.292.7928, FAX 614.292.5237; [cobey.1@osu.edu](mailto:cobey.1@osu.edu)

## BEEKEEPING IN NORTHERN CLIMATE SHORT COURSE

The University of Minnesota Beekeeping short course teaches how to keep bees in cold climates. The method of colony management taught in the course is based on Dr. Basil Furgala's system, which ensures high honey production and wintering success. Other topics covered are equipment needs, disease and mite control, and extracting, bottling, and marketing honey. The cost for the two-day course is \$55, which includes a 68-page manual, lunch, and refreshments. A discount on an accompanying video is available to those who attend the course. The course will be held Saturday and Sunday, March 10-11.

Friday, March 9 is a full day on the biology, behaviors and

anatomy of honey bees. This one day, fun class is a highly recommended addition to the management class. People may attend just the biology course for \$20 or both courses for \$70.

All courses taught by Dr. Marla Spivak and Mr. Gary S. Reuter on the St. Paul campus of the University of Minnesota. For further information and registration brochures, please call, write, e-mail or visit our web site. 612.624.3636, University of Minnesota, Department of Entomology, 1980 Folwell Ave. Room 219, St. Paul, MN 55108-6125, [spiva001@tcumn.edu](mailto:spiva001@tcumn.edu); [reute001@tcumn.edu](mailto:reute001@tcumn.edu); [www.entomology.umn.edu/](http://www.entomology.umn.edu/)

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skipped over the rut tops, then settled in a steaming heap, surrounded by seven-foot goldenrod on one side and corn as high as an elephant's eye on the other. As directed, I pushed ahead another 50 feet, in a row surrounded by an electric fence. He lit the smoker on the tail gate and big billows of baling twine smoke filled the car. I pulled the drippy supers out of the car, then lifted partially full supers off the hives and replaced them over the empties. Reverend Bence directed me to K-turn into the corn where excessive ground water had stunted it. "Bumpabumpabumpa" through the plow ruts. I accelerated to 15 mph and spun up the bank onto the dirt road toward home.

The sun was setting on a beautiful late Summer day as we started up the washboard hill, windows open to clear the smoke. Crumpled sticky newspapers rattled around the back in the breeze. A couple stray bees buzzed up and down the windshield.

"What's that grinding noise?" Reverend Bence wondered, listening to the engine.

"We've been having a little trouble with the transmission lately," I lied. I dropped him off, then drove home. Heading toward the house I look back at the old station wagon. A stalk of corn hung from the license plate. A couple sleepy homeless bees buzzed above the dashboard. I just might get a real bee car sooner than I expected. 

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I wish I had a real bee car. You may have one already. A rusted tin-can heap that still runs, smelling of smoke and beeswax. Bee carcasses are jammed between the windshield and dashboard. The shredded upholstery has burn holes in it. Sure, I could buy an old junker, but for the few hives I have it would be hard to justify.

The retired Reverend Bence has a real bee car, a four-wheel drive "Jimmy." The mechanic said this was its last year – next inspection the frame would be too rusty to pass. That means he can drive the condemned vehicle as hard as he wants knowing if it dies now he won't have lost much. I've ridden with him a few times and I've never heard a more dissonant orchestra of clanks, clunks, rattles, shudders, scrapes, whines, thuds, pings and dings. Old bee stuff litters the floor and dash. Sticky newspapers, supers and baling twine bounce around in back. And the delicious aromas of beeswax and smoke bring tears to your eyes. Well, mostly the smoke.

Reverend Bence has beeyards tucked all over the county, two hives behind an abandoned barn, one or two more in a horse pasture, three beside a creek, and a single hive behind his barn in town. The number of hives has dwindled with time, but not the number of apiaries. The reliable old Jimmy is an essential tool of Reverend Bence's honey business. I've ridden with him to a few of his apiaries, always half expecting to hitchhike home.

One afternoon Reverend Bence needed some help hefting supers at his Ellis apiary. I drove to his house in our family station wagon and loaded my stuff into the back of the Jimmy between the spare gas can (he's not sure how accurate the gas gauge is) and the smoker. We got in and he turned the key. The starter whined but the engine didn't fire. "Jimmy's never done this before," Reverend Bence mused. We poked at the engine a few times and poured a little gas into the tank just in case.

"Let's just take my car," I offered, thinking about old vehicles and corroded brake lines and how I still had a family to raise at home.

So we loaded his and my stuff into my car on some old newspapers and set out for the Ellis apiary, Reverend Bence navigating and me behind the wheel. We took a shortcut over a seasonal dirt road, washboarded down a steep hill in low gear and turned up a steep rutted hill just past the Ellis farm.

"Turn here," he said suddenly.

"Huh?" I questioned. There was no turn, just weeds, a ditch and a 50-foot embankment.

"Right right here," he repeated.

I slowed to a stop. The roadside weeds did seem slightly thinner in two spots about a tire width apart. A skidder trail abruptly descended from the road down a steep embankment, the left side washed out. Far below I could see the two tracks flanked with stagnant brown green water. Beyond the swamp, the trail snaked through goldenrod along the edge of a cornfield.

"It's all right. You can make it." Reverend Bence coaxed. Ellis probably had a tractor. It was a farm after all. So I cinched my seat belt tighter, cranked the wheel hard to the right and put the car into low gear.

Driving cars through pastures and over swamps is a useful skill picked up by many young farm boys. The inconvenience of getting stuck a couple dozen times and pulling bumpers off your parent's cars while towing them out of ruts teaches a youth the

delicate balance between speed with momentum and slow driving to avoid concussions and tearing off axles. One also learns to assess field conditions accurately and quickly from a moving vehicle for quick decisions. The dirt looked soft. I opted for velocity.

"Whoa! Slow down!" Reverend Bence seemed to think I was going too fast. He only had horses and wagons when he was a boy. "There's some big

"The farmer hadn't dragged the dirt path after plowing the cornfield. Our heads made a "bumpabumpabumpa" sound on the ceiling of the car as we

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## A Real Bee Car

Peter Sieling