125 YEARS
THE A.I. ROOT CO.
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PUBLISHING EXCELLENCE

NOV 1997
Bee Culture

RETAIL HONEY CONTAINERS

What Does The Future Hold?

Glass containers are still popular, but quality for many styles is decreasing, availability questionable and costs are increasing.

No doubt, it is a Bear market as container costs increase, and demand for smaller sizes climbs.

Plastic containers are improving in quality, versatility and availability, and costs are low.

Bee Culture
THE MAGAZINE OF AMERICAN BEEKEEPING

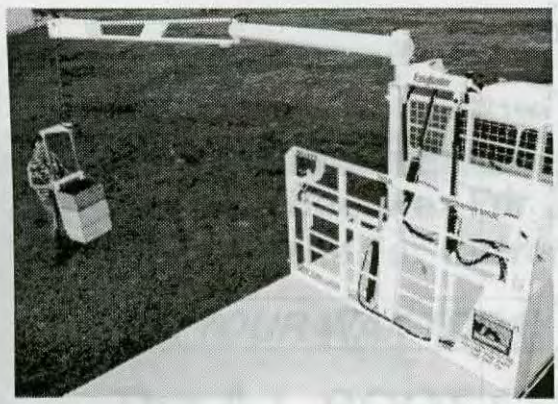
November 1997 VOLUME 125 NUMBER 11

FEATURES

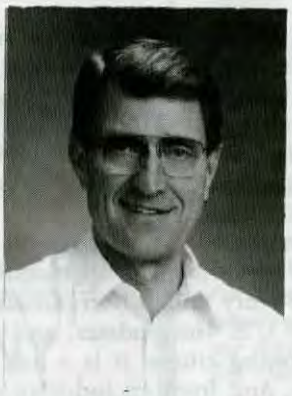
COVER
The containers we put honey in are almost as varied as the people who produce honey, and the honey produced. However, the future of glass as a container that is affordable, and useable is in question. Plastic, on the other hand is growing in popularity. Check out the article on this important subject on page 23, and plan on some changes in the jars, bottles, bears, skeps, and tubes your honey will be in, in the not to distant future.
photo by Kim Flottum

DEPARTMENTS

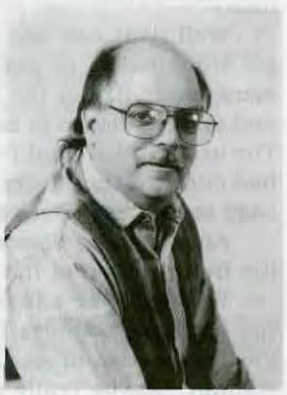
COLUMNS



New Products, Pg. 12



JOHN ROOT
Publisher



KIM FLOTTUM
Editor

Bee Culture is Printed on Recycled Paper

INNER COVER

A year or so ago an inquisitive and ambitious reporter from the Cleveland Plain Dealer called and said "Let's do lunch, and talk about bees." He had already talked to an apple grower he knew and was well on his way to a story. He talked to Jim Tew, other apples growers and a few scientists to round out his article. Then he got the paper's graphics department to do life cycles of *Varroa* and tracheal mites in color. After a month or so of research the story was published. It was terrific. Well written, essentially no errors and very sympathetic to bees, beekeepers and our industry. It was, as the saying goes, great press.

The story splashed across Ohio and was immediately picked up by AP (Associated Press), and soon all, most, or part of it was being read in something like 40 states. More great press.

Lots of papers wanted a local slant, to go along with the national voices in the original story, so they'd talk to a local beekeeper, maybe the state Extension Specialist or Apiary Inspector and follow up with a 'national' person, from the original article, and publish their story. They looked good, beekeeping got more good press . . . a win:win deal.

One of those papers was in Iowa. They followed the familiar pattern and did a good job. They even went so far as to ask for some real numbers when they called me. I gave them the numbers I had, generated by the USDA and our own surveys (the only surveys of the kind, I might add).

They wanted to know the number of colonies before mites, and now; and the number of beekeepers before mites, and now (about 5.2 million down to 3.2 million; and about 250,000 down to 150,000, respectively). Still good press. But pretty much end of story, at least for 1996.

This year, somebody's database in Iowa said it's time to check into the bee thing again, to see if it's still as bad, and to see if it gets as much attention as it did last year.

So a reporter checks in with a local source, digs out the story from last year, puts it all together and hands it in to the Editor to see if it works a second time.

Somewhere, something happened. Somehow, in the same sentence somebody combined the number of *colonies* before mites and the number of *beekeepers* before mites and turned it into . . .

"According to the beekeeping trade journal *Bee Culture,* there were 5.2 million bee colonies in the United States before the mite epidemic, half of which were wild. That figure has dropped to 250,000 today."

Well, you can see what happened. Sentences and numbers got transposed, or just plain screwed up, and that exact statement made it into the Iowa article. Then AP picked it up, again, and another dozen or so states repeated it . . . no questions asked. The assumption (and I use that word very carefully) was that Iowa had checked their facts. They didn't, and neither did anybody else. Lazy reporting. Filling space.

And then, on Sunday, September 28, on page 30 something of the front section of the *New York Times,* it appeared once again.

Whatever the cause, the story tells a horrendous story about the available colonies in the U.S. Horrendous, and wrong. From the perspective of an unknowing citizen it is a sad story. Scary actually. Maybe really scary. And from an industry viewpoint it's not so bad. Dishonest perhaps but, well, isn't it our turn for once to take advantage of this sort of situation?

That's fine I guess, unless it's you that's being grossly misquoted. Most every beekeeper in the U.S. who reads this wonders what was going through my mind when I gave those figures to the reporter. Only a couple of months ago they read in this same magazine that a half million colonies were used each year in almonds alone, plus more and more elsewhere.

We do know what's what with these figures. It's our business, and it's disturbing when we're made to look foolish. Moreso when you think back on the fact that we have for

Continued on Page 54

'Slashed & Burned'; Honey Board Changes

Reader Assistance

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Bee Culture

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MAILBOX

Comments & Requests

Just wanted to drop you a line and let you know what a fantastic bargain I believe *Bee Culture* to be. I look forward to every issue in earnest, and read your publication cover-to-cover. What are your rates for a 10-year subscription? Please inform.

My one complaint, and I know you've heard it before is your unforgiving bias toward using Apistan and unwillingness to discuss alternative methods of control. I know the reasons for this, and I don't want a reply stating your excuses for not addressing this problem. It is a belligerent attitude in my opinion for a magazine with such high standards and content.

I also found the letter sent by Laura Rendable in your September issue to be right on the money. How about more articles on the medicinal benefits of honey? Why can't babies eat honey? Are there statistics out there that we can get a look at? Have there been any cases of infant sickness or death as pertains to eating honey?

Also see if you can't get Dr. Winston to write more articles. He's great. And that story on "extreme beekeeping" – what a read. What about beekeeping in Alaska? How about an in-depth report? I for one cast my vote for its inclusion.

Again, all griping aside, thanks for making *Bee Culture* such a pleasure to read. I'm serious about that 10-year rate.

J. Victor
Tucumcari, NM

No Law Is Law

Reading Linda Batt's article in the September *Bee Culture* on how to recruit new people into beekeeping. I would strongly advise as a first step before spending hundreds of dollars on equipment and bees to set up a couple of hives in your back yard. Check your town or city zoning laws.

This past June my observation hive swarmed. I have kept this hive going for three years. I knew it was going to swarm and I wanted it to swarm.

The small swarm settled on a dead branch in a hedgerow separating my property from my neighbors.

When I came home from work I proceeded to hive the swarm, my neighbor watching from a distance. He yelled what are those? Yellow Jackets? I explained to him how my observation hive (he never even knew I had one) had swarmed, that they were only honey bees and that I was going to hive them.

I had an extra veil and invited the gentleman over to watch what I consider to be one of nature's greatest shows, bees moving into their new home.

The man wanted nothing to do with it and added "those bees better not bother me." He looked at me as if I was half crazy.

Three days later a certified letter arrived from the City Hall of the Great City of Torrington, CT. Enclosed was a cease and desist order to remove my bees, including my observation hive within 10 days or face a fine of $250.00 per day or 10 days in jail or both for each additional day I was not in compliance.

I went to the City Zoning Department to ask about the order. The officer said that they had received an anonymous complaint (I can't imagine who) and that "Although there is no law in Torrington that you cannot keep bees, if a complaint is received they must act, anonymous or not.

Luckily I have an outyard in the country where I moved my bees.

The small swarm developed into a full two-story hive by late August, but my observation hive went queenless. I attribute this to having had to move it at the critical time when a new queen had just emerged.

This incident has left me very bitter. I am looking for a place to move where I can keep my bees legally. Although I do have my outyard, I miss having a hive around my home and especially miss my observation hive which is now rearing lots of cute little drones in an old smelly barn.

Beware the ignorant public.

Check your town or city laws first.

George Piper
Torrington, CT

Good Ideas

To Mike Lashbrook of Morton, IL. I know how you feel about starting out with bees, because I was there several years ago. You can only get so much info from magazines, reading books or any other source. What I would suggest to you is talk to the people at your County Extension office, as they should have lists of beekeepers who would be happy to help you. In Ohio we have very capable people in the State Beekeeper's Club, and are blessed with OARDC, in Wooster. Our state inspectors are also very capable, and will give you a 32-item Apiary Analysis which is very complete.

Last but not least in many of the areas in Ohio the fire and police have swarm lists. Ask your local fire or police if they have these lists and contact some of these people. They would have a lot of experience with bees. You will find each year is different and what you think that bees would do they will fool you. Good luck.

Harold Rogers

Evolution or Creation?

In the September issue of *Bee Culture* you have your regular column written by Clarence Collison called "Do You Know?" As this column purports to deal with

MAILBOX

facts relating to apiculture, is it not reasonable to ask that all the questions and answers given, be of such a nature as to be able to be proven by established practices, common sense, or scientific facts beyond dispute? I refer to his paragraph located between questions #16 and 17, stating that "Geological history indicates that bees and the flowering plants (angiosperms) have been intimately associated with each other for 60 to 100 million years." If Dr. Collison were asked to prove this statement, he might agree with me that by allowing a 40-million year period over which something might have occurred, can hardly be considered concrete and irrefutable evidence! Even more relevant, is the issue that to many of your readers the marvelous bee was created as described in the first chapter of Genesis, and for those of us with sincere religious beliefs, we wish to give the honor to God for creation, not to man for the development of a theory of creation that cannot be proven and that uses periods of time that are unprovable and beyond our human comprehension.

Since there may be some of your readers who would be offended by article writers who would submit a question and answer column where the questions about bees were based on Biblical history and the answers were found in the Bible, you might consider keeping both the evolutionary concept and doctrine out of supposedly factual articles, as well as the creation account of nature, and let each of us choose our own understanding of the origin of nature.

Leon Moyer
Rogersville, MO

A Better Idea

I read the article "Five great ideas for more members" by Linda Batt in the September issue of *Bee Culture* and I think I can add another.

I lived in southeastern Michigan for 28 years and was a backlot beekeeper for most of those years. During this time I met a lot of young people who wanted to get started in beekeeping, but couldn't due to the cost of equipment and supplies.

When I retired in '96 and moved to Colorado I had a choice of leaving all my hives and equipment or selling it. I decided to do something else instead.

I gave 10 hives (no bees), and some supplies to a young man who was going to share it with a brother and a cousin. That left me with 20 or so hives, a four-frame radial extractor, a wax melter and some other supplies. I gave these to a local retired commercial beekeeper with the understanding that they were to go to young people hoping to get started.

I just heard that a group of young people got the bulk of it and are starting a joint venture in beekeeping. I wish them the best of luck.

While I'm writing this, I have a request for help also. While I was living in Michigan I was a member of the Southeastern Michigan Beekeepers club. Since I moved to Colorado I haven't been able to find a club in this area.

Do you know of a beekeeping club within this area of Colorado? If so, I would appreciate it if you would tell me how to contact them.

Ted Dutton
504 Locust Ave.
Lochbuie, CO 80601

Bee Cool Data

In the September issue of *Bee Culture*, page 34, you have an article on evaluating a hive ventilator, written by Walter Arader. In it he comes to the conclusion that the hive ventilator allowed the bees to produce 22.02% more honey. I have to disagree.

In the table on page 34, in the bottom half it shows the gains of each hive with and without the ventilator. The first period, April 24-May 11 (18 days) shows an increase of 19 lbs. of honey for the hive "without" the ventilator and only 10 lbs. for the other hive with it. This would support the fact that something besides the ventilator caused the difference.

In the next period May 13-May 31 (19 days if you don't account for the missing day of May 12th) this same hive did produce 18 lbs. more with the ventilator. The next period, June 1-June 21 (22 days) 27 lbs. more honey was produced by the other hive with the ventilator. This only shows that you cannot judge the ventilator based on these figures.

Now look at the chart as a whole to see a truer picture of what is happening. The number two hive does best with or without the ventilator from April 24-May 31. From that point on the number three hives does better. It is apparent to me that the following

Continued on Next Page

MAILBOX

is what is happening. Hive number two has more bees who are collecting honey during the period of April 24-May 31. Hive number three has more bees hatching and eating honey during this period. My basis for believing this is the following. From June 1 until July 23, hive three does better with or without the ventilator than hive two. It only does slightly worse than hive two during the July 24-August 13 period. It is more likely that the difference is caused by the number of field bees collecting than by the ventilator.

As more proof, it is obvious that the best honey collecting period was from May 13-May 31. The hive with the ventilator (hive 2) does better but it is during this time of peak strength for hive two. The other hive does better the next week and it does have the ventilator but it is also at this time that the increase in hive strength seems to take place. The problem with the way the experiment was done has caused it to look as if the ventilator did it. Both of the peak nectar collecting weeks the ventilator was on different hives.

My conclusion is that the difference is caused by the number of field bees in each hive at the different times. If you were to make a line graph of honey collected you would see the strength of the hives change. The absolute proof is seen in the percentages shown under the "Period end" sections. One shows a 22.02% gain with the ventilator over the one without it. But comparing the number two hive against the number three hive (they both had the ventilator at varying times), you can easily see number three-hive outperformed number two hive by 18.81% with or without the ventilator. This is almost the exact amount of difference in the ventilator verses non-ventilator table. I have to conclude that the difference in the ventilator vs. non-ventilator is imagined. It is clearly the number of field bees working that caused the difference.

To find the truth using only two hives and one ventilator, place the ventilator on hive two and leave it there. Each day move hive three to hive two's spot and hive two to hive three's spot. Alternate them each day and you will have taken away the field bee differences. Each hive will, for all practical purposes, have the same number of field bees. You will then have an accurate reflection of the ventilator instead of field bee strength.

Frank Chamberlain
Asheboro, NC

Beekeeping, An Introduction To A Unique Industry. The OH State University Publications Department has taken the video series produced by Jim Tew and turned it into a 14-part VHS series intended to acquaint the novice beekeeper with all aspects of the industry. Each of 14 tapes are an hour or more long and cover: History, equipment, manipulating a hive, business, biology, pollination, honey, other products, anatomy, the sting, queens, diseases and pests, African bees and the seasons.

Excellent for clubs or the isolated beekeeper, this series introduces you to some beekeeping personalities, like Reg Wilbanks, Paul Jackson, USDA scientists, John Root, and others.

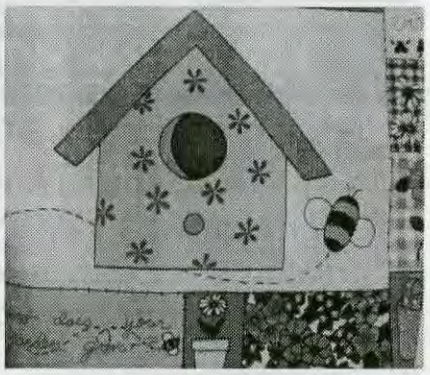
You'll visit USDA bee labs, a beekeeping museum, visit the Walter T. Kelley Co., The A.I. Root Co., go to Mexico, see lots of closeup work with microscopes, and more.

Hosted by Jim Tew with Dave Heilman this series is an all inclusive educational, and entertaining investment.

This set can be used as a correspondence course, using the included text and other extra material for an additional $40.. To do this you must obtain the series and books from Dr. Tew directly at 1680 Madison Ave., Wooster, OH 44691.

For the set and book, without the course, contact OSU Extension Publications Office, 385 Kottman Hall, 2021 Coffey Rd., Columbus, OH 43210-1044. Cost is $140. (14 tapes + book), plus $6.75 P & H. (OH residents add $8.50 state tax).

Bug Prints. Maybe you've noticed the large number of bee fabrics available this year. Many are already out of print, but Bug Prints, a new enterprise devoted to fabrics with bugs and bees, has been accumulating these fabrics. This company was created to serve the needs of sewers, quilters, or for people who collect cloth with an entomological theme. This year alone there have been over 100 different prints with bugs or bees and Bug Prints has them.

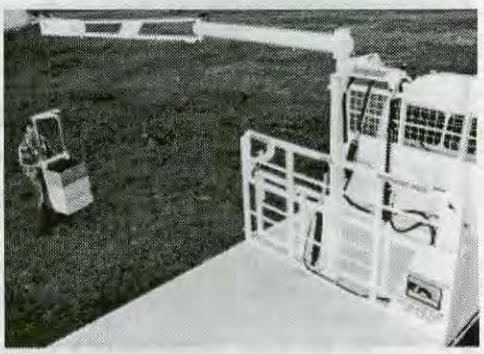


Bug Prints offers many of these bee fabrics grouped in several themes, such as bears and bees, bees in the garden, juvenile prints with bees, bees and other bugs, flowers and bees, skeps, and just bees. The patterns come in checked, striped, tossed arrangements, and in large, or small prints in vibrant, muted, or pastel colors. Some prints have a border and coordinate fabric which can be sold together.

Bug Prints sells the fabrics in packages of quarter yard cuts (4 to 6 different fabrics per packet) each with one of the themes mentioned above. They also sell one-half and one yard sizes, and if requested certain fabrics can be sold separately. There are also kits of bee aprons, tote bags, and vests that are ready to cut-out and sew.

If you are looking to make that special, unique gift, contact Bug Prints. Or, if you like quilting and need quilting squares Bug Prints can put together a special package for you. A color representation of the fabrics is available SASE if you write to Bug Prints, P.O. Box 1748, Wooster, OH 44691. Check or money orders are accepted.

Hot News From Australia! Back problems no longer need to "bee" your problems.



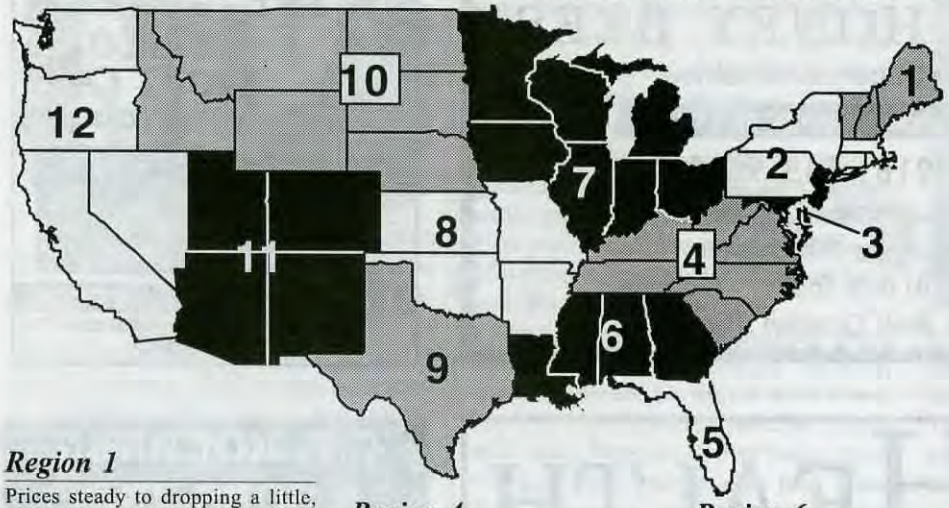
Introducing the Billett Easyloader fast becoming the biggest selling newest and most innovative product to be launched in the Australasian beekeeping market this decade and has become the most sought after product by our beekeepers.

With four models available, suitable for one-ton pickups up to the largest of trucks, lifting capacity from 0 to 22KG (440 lbs.) out to 4.8M (15'9") reach and 360 degree swing without outrigger legs, the loader is a one man operation, 12 or 24 volt electric winch, an adjustable lifting cradle with up/down bar control incorporated. A split boom gives ideal maneuverability amongst trees and obstacles. It offers automatic hydraulic leveling, or manual leveling. Folds down into a slim frame for transportation and can be removed from the truck completely if necessary.

For more information, contact D&K Copeman Engineering, 63 Southern Cross Drive Ballina, N.S.W. Australia 2478, Ph/FAX +61 2 66869746 or Direct FAX +61 2 99558914, E-Mail bennetti@abol.net.

Bee Cozy. The Bee Cozy™ is a 100% nylon outdoor sports fabric wrap for protecting colonies in the Winter. The manufacturers state the black wrap is windproof, breathable, quick drying and UV resistant. The wrap encircles a colony, leaving the top uncovered and entrance open. It is a one-size-fits-all unit as it attaches to itself with velcro tabs and attaches in seconds. It folds into a 5½" x 6¾" x 1" pouch for easy storage. It is washable. Dimensions are 6' long x 18½" wide, with three velcro tabs. It will wrap one deep super. $24.95 + $3. domestic shipping to P.O. Box 116, S. Salem, NY 10590. Or, www.westchesterweb.com/beecozy.

NOVEMBER – REGIONAL HONEY PRICE REPORT



Region 1

Prices steady to dropping a little, but not much. Production ranged from 20 to 110 lbs./colony average, but overall up for the region this season. Raspberry, knapweed, clover, alfalfa and bamboo crops reported. Fall flow about average.

Region 2

Prices going up but appear to have leveled off, according to reporters. Production per colony ranges from 45 to 90 lbs., down across the board. Clover, bamboo, berries, alfalfa and locust crops reported. Fall flow down.

Region 3

Prices down a bit and heading even further according to reporters. Production way down on average, at about 50 lbs. per colony. Clover main crop, along with generic wildflower. Fall flow down.

Region 4

Wholesale prices down, retail prices up. Production ranges from 15 to 130 lbs per colony, which comes to a bit above average production for the region. Clover, wildflower, tulip poplar, and berries are crops reported. Fall flow strong to average.

Region 5

Prices only steady this month, but up a little at wholesale. Seasonal demand slowly picking up. Production way down this season, on average so far, with wildflower and citrus major crops.

Region 6

Prices stable to down just a fraction. Production ranges from 35 to nearly 300 lbs. per colony, but overall the region is about average. Tallow, clover and cotton, along with wildlower are the crops.

Region 7

Prices only steady, but, reporters predict, will drop soon. Reporters production ranged from mid 40s to about 100 lbs. per colony, but almost everybody is down, across the region. Clover predominates, but a basswood crop helps. Fall flow strong.

Region 8

Prices slowly dropping but reporters predict are leveling off. Production ranged from 50 to 200 lbs. per colony of clover, goldenrod, and basswood. Fall flow about average.

Region 9

Prices steady, but not increasing. Production mixed across region, but down more than up. Cotton a crop, but others important, mostly mixed wildflowers.

Region 10

Prices steady to up a bit, but sales slow at the moment. Alfalfa primary crop in the region, but sweet clover abundant. Clovers not incredibly productive, though. Fall crop way down.

Region 11

Prices slowly dropping across the board, but only slowly. Mesquite, alfalfa and various wildlowers the crop, and Fall flow mostly strong.

Region 12

Prices steady to declining a bit, but mixed-up, mostly. Crops include Star Thistle, Clovers, fireweed and berries. Fall crops mixed, due to weather, and fire.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													Range	Avg.	Month	Yr.
Wholesale Bulk																
60# Light	67.14	74.00	61.00	70.60	65.75	64.50	68.80	77.00	54.00	60.00	70.50	71.20	51.00-85.00	69.01	68.85	64.59
60# Amber	63.21	69.46	59.00	64.00	64.50	59.33	64.13	73.33	52.00	62.61	65.14	60.80	33.00-90.00	64.84	67.13	59.40
55 gal. Light	0.89	0.98	0.96	0.90	0.78	0.90	0.92	0.96	0.95	0.80	0.86	0.91	0.65-1.30	0.92	0.96	0.97
55 gal. Amber	0.84	0.94	0.90	0.88	0.71	0.81	0.90	0.96	0.91	0.90	0.79	0.88	0.55-1.30	0.86	0.93	0.88
Wholesale - Case Lots																
1/2# 24's	30.19	27.98	34.26	32.78	24.00	42.00	27.94	35.00	30.00	34.26	27.53	32.43	24.00-48.00	30.79	30.77	27.48
1# 24's	42.30	37.50	38.40	44.55	41.40	40.90	40.47	45.77	46.25	43.00	45.57	46.20	24.27-65.00	43.10	43.09	39.81
2# 12's	39.38	34.78	40.20	49.36	37.00	36.90	39.67	47.95	42.10	36.00	39.25	37.24	29.40-60.00	40.23	39.29	38.58
12 oz. Plas. 24's	35.74	33.85	38.40	36.90	36.00	34.20	35.68	37.70	39.90	38.10	42.21	31.84	16.80-50.00	36.59	36.94	34.78
5# 6's	39.73	37.35	46.50	49.62	43.15	37.70	36.45	52.00	46.00	36.13	38.97	37.61	24.00-65.00	40.59	41.46	37.60
Retail Honey Prices																
1/2#	1.86	1.83	2.33	2.37	1.20	1.77	1.67	1.76	2.95	2.35	2.30	2.05	1.19-3.20	1.89	1.91	1.70
12 oz. Plastic	2.22	2.24	2.25	2.39	2.23	2.44	2.08	2.18	2.96	2.31	2.41	2.11	1.61-3.15	2.26	2.23	2.12
1 lb. Glass	2.68	2.55	2.50	2.70	2.15	2.84	2.52	2.45	3.50	2.60	3.07	2.85	1.90-4.50	2.71	2.68	2.53
2 lb. Glass	4.44	4.29	4.50	5.23	3.86	4.98	4.36	4.12	4.75	4.35	4.38	4.59	3.29-8.25	4.48	4.50	4.16
3 lb. Glass	6.06	7.35	6.50	6.69	5.15	6.43	5.80	6.14	6.25	6.61	6.07	6.03	4.65-9.00	6.19	6.26	5.50
4 lb. Glass	7.68	6.50	8.88	8.67	7.50	8.50	8.51	8.60	7.50	8.88	6.98	6.40	6.00-12.69	7.95	8.31	6.56
5 lb. Glass	9.04	8.56	9.75	9.75	7.63	9.75	9.19	9.50	10.00	8.08	9.06	9.30	6.75-14.99	9.20	9.40	8.49
1# Cream	3.27	3.38	3.96	3.19	3.96	3.50	2.59	2.98	5.75	2.00	4.50	3.33	1.79-6.79	3.30	3.36	3.05
1# Comb	4.14	4.10	4.04	3.87	4.04	4.00	4.03	4.11	5.00	3.50	5.85	4.33	2.75-7.80	4.31	4.15	3.96
Round Plastic	3.73	3.15	3.50	3.75	4.21	4.00	2.98	2.90	4.19	3.00	5.40	4.34	2.29-6.50	3.83	3.85	4.00
Wax (Light)	2.83	3.69	2.50	2.05	2.03	2.84	2.43	2.50	3.80	2.35	2.22	3.63	1.50-7.50	2.82	2.74	2.70
Wax (Dark)	2.40	3.13	2.13	1.88	1.57	2.40	1.96	1.40	2.75	3.04	2.03	3.54	1.20-5.50	2.41	2.39	2.39
Poll. Fee/Col.	35.83	36.40	25.24	36.56	27.50	41.25	34.00	40.00	15.00	51.00	38.08	34.50	15.00-70.00	36.35	35.43	32.95

Roger Morse

Research Review

"There are at least a dozen introduced nectar- or honey-producing plants in the U.S. under fire from one government agency or another."

"The drone's function in a honey bee colony is solely reproductive." Drones do no work, do not feed themselves, and do nothing that helps to keep a colony prosperous. Studies on their biology are therefore usually more for the interest they contain than to aid in colony management.

Studies at the University of California at Riverside confirm that drones begin to fly and try to find a mate at six to nine days of age. (Mating never takes place in a hive but at heights of 20 to 50 feet away from the colony.) However, the "drone's antennal sensitivity . . . is strikingly mismatched." Drones are most sensitive to the queen's sex attractant at a younger age, and as they grow older they lose their ability to detect the sex attractant with their antennae. On the other hand, worker honey bee sensitivity to the queen's pheromones increases slowly, and plateaus at about 15 days of age.

In the paper below, it is reported that drone antennae are also sensitive to isopentyl acetate, the alarm odor. This has not been reported previously. However, how the drones respond is not known.

These tests were made by removing drone antennae and mounting them in a block of wax. Electrodes were attached to the antennae, and as odors were waffed over them their responses were recorded.

Vetter, R.S. and P.K. Visscher. *Influence of age on antennal response of male honey bees to queen mandibular pheromone and alarm pheromone component.* Journal of Chemical Ecology 23: 1867-1880. 1997.

A Biological Control Backfire

There are at least a dozen introduced nectar- or honey-producing plants* in the United States that are under fire from one government agency or another. These include salt cedar, Brazilian pepper, melaleuca, purple loosestrife, and an introduced thistle. All of these plants, and more, have been targeted for control by insects that feed on them in their native homes. All this is being done because some people, other than beekeepers, think they are bad plants.

The use of imported insects that are their natural enemies to control so-called noxious plants that have been introduced is one form of biological or natural control. There have been some spectacular successes using biological control, and certain introduced plants (and animals) have been brought under control in this country by importing their natural pests. In fact, the United States has several researchers working abroad seeking out insects that might be useful in this regard. However, there have also been some dismal failures, one of which has been flagged recently by some ecologists.

The problem is that a weevil imported from Europe and Asia and widely distributed by state and federal agencies and their counterparts in Canada since 1968 to control an imported thistle also feeds on other species of native North American thistles, some of which are rare. Thistles are not major honey plants in North America, but they are important in many places and are part of a group of probably more than 2,000 plants on which bees feed during the year.

All this has created quite a fuss. This little war among ecologists – those who want no change and those who want to do away with imported plants they think are noxious – is likely to continue for some time. The underlying philosophy has an effect on beekeepers as over half of our honey, like honey bees themselves, is produced from plants introduced from elsewhere on Earth. There is no good solution to this so-called problem, but that does not prevent people from expressing opinions. The results of this little feud may be good for beekeepers as there are likely to be fewer purposeful introductions of insects to control plants some people think should be eliminated or reduced in numbers.

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*Ever since I can remember, there has been a debate over whether a plant that produces nectar that bees make into honey should be called a nectar plant or a honey plant. I think a purist would say they should be called nectar plants, but I use the terms interchangeably. BC

Louda, S.M., D. Kendall, J. Connor and D. Simberloff. *Ecological effects of an insect introduced for the biological control of weeds.* Science 277: 1088-1900. 1997.

Strong, D.R. *Fear no weevil.* Science 277: 1058. 1997.

Mark Winston

Mark's Gold

"The grant game has changed and we're moving away from grants in which we have freedom to conduct research."

Beekeepers in Vancouver received piles of free tickets to the opening of the movie *Ulee's Gold* in June, and we eagerly awaited the beekeeping scenes. In case you've had your head in a beehive for the last year, and don't know about Ulee, his character is a Florida beekeeper played by Peter Fonda. The movie does have a plot, some pretty fine acting, and best of all, nobody gets "swarmed" by killer bees or attacked by bees masquerading as aliens. The movie also has some of the finest and most realistic scenes of beekeeping I've ever seen, and every beekeeper in the theater felt like he or she was lifting supers, smelling propolis, smoking the bees, and getting bone-tired along with Peter Fonda.

As my wife and I drove home that night, with tranquil Southern bee yards still dancing through my head, I began to fantasize about making a movie about myself, called *Mark's Gold.* Mark would also be played by Peter Fonda, but instead of being a slow-talking Southern beekeeper, he would be a slow-talking Vancouver bee scientist. As the movie reels began to roll through my brain, the opening scene found me in one of our prettiest bee yards, with snow-capped coastal mountains in the background, a hive tool in my hand, and honey-laden hives waiting for my careful inspection. Unfortunately, this fantasy scene was too far-fetched, and I couldn't maintain the illusion in my mind. Oh, we do have pretty yards, snow-capped mountains, and honey-filled hives, but the problem was that I'm not usually in the scene. Rather, the opening scene should portray our bee scientist in his office, computer on in the background, and Dr. Mark on the phone screaming at a university administrator or a government official because of some bureaucratic snarl-up that has prevented grant money from arriving in an account so that our star can pay his students so that *they* can go out to the scenic bee yard.

I was fortunate to arrive at Simon Fraser University in 1980, when it was relatively new and the granting agencies to which I applied were user-friendly. Things have changed: My university has matured into a hardening bureaucracy with increased paper pushing, and considerably less willingness to take risks without all the bureaucrats covering their hind ends to protect themselves against making a "mistake." The grant game also has changed, and we're moving away from grants in which we have freedom to conduct research and into contracts in which every aspect of research needs to be defined ahead of time, reported in ongoing detail, and covered by extensive paper agreements just in case a marketable product should happen to be discovered. And, my university is attempting to siphon off grant money for "overhead," so that less and less of the funds I receive actually go toward research.

This is a familiar story to most researchers. The majority of our research time is spent first writing grants, then administering them, and finally writing endless reports that are filed away in an agency office somewhere. Why should this be of concern to beekeepers? Quite simply, because beekeeping research in the future will be funded increasingly by commodity groups like yourselves, and as grantors you want maximum research and minimum paper shuffling for your money.

This subject was on my mind when I went to see *Ulee's Gold,* because about that time, I came within a hair's width of having to lay off my students and shut down our Summer research because of grant bureaucracy. It's not that I didn't have grant money; we have about $150,000 a year from various sources with which to conduct research, which is more than adequate for our research program. Rather, the government agencies that were funding our projects had not sent the checks yet, and my own university administrators were insisting on new layers of paperwork to deal with the government agencies, apparently because enough paper hadn't been pushed yet to feed their office. I had to spend the better part of a month generating letters, reports, and memos so that university and government officials could feel that they had performed their jobs.

One set of grants came from our British Columbia government and were the second year of two-year grants that had already been approved. One grant involved blueberry pollination research, the second, the use of neem as a miticide, and both were grants in which the government matched financial contributions from industry. Normally, renewals are automatic, assuming reasonable progress, and the research for these projects had proceeded well. However, I got caught in a catch-22 situation that froze our funds in a government account. The Ministry of Agriculture decided to change programs midstream, and made one of those periodic shifts that governments do in order to appear to be

Continued on Next Page

"As my wife and I drove home that night, with tranquil Southern bee yards still dancing through my head, I began to fantasize about making a movie about myself, called *Mark's Gold.*"

doing something constructive. In this case, they canceled the program under which the grants had been issued, started up a new program with a sexier name, and began to develop a new contract. I had endless e-mail messages assuring me and my university financial officers the funds had been approved, but the university wouldn't let me spend the money until they saw the contracts, and the government wouldn't send the money until the university signed the contracts which the government had not yet prepared. April went by, May, and June, my other grant money ran out, and although I had ample money approved, the checks were not even "in the mail."

I did resolve the situation eventually, but not by doing research. Rather, I spent weeks sending angry e-mail messages, making countless phone calls, and meeting with department chairs, deans, and vice-presidents. In the end, the problem suddenly evaporated. The government decided to treat renewals under the old contracts, sent the checks, and it was as if the problem had never existed.

Unfortunately, that wasn't my only grant problem. I had applied for three grants from the government of Saskatchewan under a new program called the Agri-Food Innovation Fund, and after almost a year of silence, I suddenly received approval in principle for all three grants. However, I had to take my original application and rework it into another format. The first application had gotten me an invitation to apply for the grants that I had already applied for, and I now had to fit the same application onto a new form. Fine; did that, and some months later received approval for the three grants, but now I had to await the issuing of contracts. The grants were supposed to start in December of 1996, and I naively assumed that it would be safe to go ahead and hire students to do the research in the Summer of 1997. After all, the grants had been approved at the highest levels of the Saskatchewan government, and it didn't seem to be in the best interests of the beekeeping community to put off the projects yet another year while contracts were being finalized for funds that had been clearly approved.

Well, I was wrong. Again, months went by without a contract arriving, the projects began, and I soon ran out of money. Finally, the contracts came, I was ready to sign, but first I had to pass them by our university grants office for their approval. I'm sure you can see what's coming: They insisted on numerous changes, and we're still going back and forth on these contracts between my university, the government of Saskatchewan, and lawyers. Fortunately, my department chair has a much shorter fuse than I do, and with the intervention of his considerable temper, the vice-president of our university agreed to let me run my other grants deep into debt in the expectation that these contracts would eventually be approved.

These grant nightmares are the rule rather than exception these days, and I spend too much time writing and administering grants, writing grant reports, and going ballistic in order to keep the paperwork moving fast enough so my students can actually do the research. Beekeepers complain about the slow pace of research, and want to know why science takes so long. Careful work does take time, and there is a rhythm to properly conducted research that can't be hurried, but the grant game has become a serious impediment to getting the research done that our beekeeping community needs, and needs quickly.

This problem should be of concern to beekeepers, but of course there is relatively little any of you can do to force governments or university bureaucracies to function more efficiently. I'm sure each of you has experienced the same frustrations when you have had to apply for a permit to export honey, renew your business license, or deal with regulations involving your honey house. All of us would rather spend time with our bees than with our computers, and my grousing about research grantsmanship keeping me from doing research is really no different from your complaining about business paperwork keeping you from your bee yards.

However, something new is about to happen that does put you in a different position. Both Canadian and American beekeepers have or shortly will have national research programs funded and administered by beekeepers. In Canada, our Canadian Bee Research Fund is being run by the Canadian Honey Council, and in the U.S., it appears likely a similar research fund will be set up through the National Honey Board. Thus, you're going to need to make decisions about how you disperse the funds, and how you administer grants to insure the projects are proceeding in your best interests. There is an opportunity here to provide researchers with a simplified process to apply for and administer grants so we can spend more time actually doing research and less of it on the computer and the phone trying to work our way through frustrating bureaucracy.

When the time comes to set up your grant administration, think about the researchers you fund appearing in an imaginary research version of *Ulee's Gold.* Will they be out in the bee yard collecting data, or back in the office on the phone? Will they be tired at the end of the day from working with bees, or exhausted from writing angry e-mail messages? There are better ways to administer grants than what we have today, and I hope beekeepers do a better job than governments and universities have been doing. Peter Fonda did a great job of playing a beekeeper, and I could even see him playing a bee researcher, but I'm pretty sure we'll never see him play an administrator. BC

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? DO YOU KNOW ?

Honey Bee Anatomy

Clarence Collison
Mississippi State University

In its general form, the honey bee resembles any other insect, however, since the bee leads a highly specialized kind of life, it has numerous modified structures that allows it to live this life style. The feeding organs of the bee are very different in form because they are adapted to the ingestion of both pollen and liquids. The wings of the bee are developed for swift flight and for carrying heavy loads. The legs are modified in their structure for various uses besides that of locomotion. Ovipositors in other insects are organs designed for depositing or laying eggs, not for stinging. Please take a few minutes and answer the following questions to find out how well you understand honey bee anatomy.

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

1. ___ The blood (hemolymph) of the bee is responsible for supplying oxygen and removing carbon dioxide from all of the living tissues of the body.
2. ___ Male and female honey bees have the same number of antennal segments.
3. ___ Mandibles (jaws) of the queen and drone are larger than the mandibles of the worker.
4. ___ When a honey bee flies, the tip of the vibrating wing describes a figure 8.
5. ___ The honey bee thorax contains four segments.
6. ___ Branched hairs cover the worker honey bee's body.
7. ___ The proboscis is formed by bringing together the free parts of the labrum and labium.
8. ___ The wings of the honey bee are attached to the prothorax and mesothorax.
9. ___ Wing hooks (hamuli) are found on the hind margin of the forewings.
10. Name three functions of the honey bee proboscis. (3 points)
11. Name two ways in which the sting of the queen differs from that of a worker. (2 points).

Please match the following body parts with the correct location on the worker honey bee's body. (1 point each).

A. Head B. Thorax C. Abdomen D. Proboscis E. Hind Legs F. Wings G. Middle Legs H. Fore Legs I. Antennae J. Mandibles

12. ___ Corbicula
13. ___ Scape
14. ___ Flabellum
15. ___ Wax Mirrors
16. ___ Flagellum
17. ___ Antennae Cleaner
18. ___ Ocelli
19. ___ Cibarium Sucking Pump
20. The honey bee has a total of ____ pairs of spiracles, ___ pairs on the thorax and ___ pairs on the abdomen. (3 points).

ANSWERS ON PAGE 55

Some Thoughts From Tucson

Kim Flottum

Some basics on stings and stinging and swarm removal in Tucson

Besides visiting an African bee yard in Tucson when I attended the Western Apicultural Society meeting this August, I took notes on the talks of several of the speakers.

Justin Schmidt, one of the scientists at the USDA Bee Lab in Tucson, has put together a collection of data mostly unknown to beekeepers, and, unfortunately, to many medical specialists.

Some basics on stings and stinging . . .

There are 150 micrograms of venom in a honey bee, on average, or 190,000 bees per venom ounce, if you will. A lethal dose (LD_{50}) generally runs 2.8 milligrams of venom per kilogram of human body weight. That's 1.27 milligrams of venom per pound of body weight. Thus, a 200-pound person should be able to sustain up to 2,000 stings and detoxify the venom. Other medical problems, such as shock, are independent of this. To back this data up, Schmidt detailed studies of dogs that had experienced multiple stings. Those with six stings or fewer had no mortality. Those with eight stings per pound of body weight suffered 50 percent mortality. Those dogs with 10 or more stings all died.

Schmidt also studied where on the body those stings occurred. One dog suffered 3,300 stings (and died). Of those, 2,400 were on the head, and 2,200 of those were on the face. The areas around the eyes and muzzle were most stung. Also, dark areas had more stings than light areas. There were many in the mouth.

From all this, Schmidt made the following observations:

- Bees target the head, primarily the face, and specifically the eyes and breathing areas (nose and mouth).
- They tend not to target the body.
- Bees target dark areas more than light-colored areas.
- Obviously, if under attack, protect the head, the eyes, the nose, and keep your mouth closed. Good advice.

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Steve Thoenes (Tay-ness) was a researcher at the Tucson Bee Lab for several years, until budget cuts changed all that. And maybe that wasn't such a bad deal. With his experience with bees, beekeeping and, most recently, African bees, he moved right into a position with the Arizona Department of Agriculture as a consultant and program developer for African Honey Bees in the state. But there were bigger opportunities, and within a couple of years he began his own bee removal company in Tucson.

Because of the extreme climate in the Tucson area, AHB swarms are attracted to the least hostile environment – the cities. Food, water, and shelter abound in Tucson year-round, and have turned the city into a haven for migrating swarms.

The need for a swarm removal service was apparent, and Steve stepped in. His company, BeeMaster, Inc., is actively engaged in removing swarms from public and private locations, in addition to maintaining traps at highly traveled and strategic locations.

There are, of course, other entrepreneurial people who have seen the same opportunity, and the Tucson phone book now has more than two full pages in the Yellow Pages section on bee removal (check yours for automobiles, or doctors).

Even here, swarms are seasonal, reflecting the availability of food resources. Nectar and pollen availability in the desert is fairly predictable – when it rains, plants bloom. In the city, that tends to be almost year-round. Because of this, Tucson has between 4,000 and 5,000 swarm calls per year. These swarms seem to have fewer problems with *Varroa* than their European cousins, so they are "healthier" and able to move.

Steve's company has five full-time and two part time employees. They charge $80. for a swarm call in an exposed location (tree or bush), and $100. for a swarm in a building (not including wall removal or repair). His record is 17 swarm calls in a day for a single employee!

Steve's swarm removers use basically three chemicals for control. One, called Air Devil, is a professional-strength permethrin compound. A 15 to 20-second spray will kill an entire swarm and leave no residual chemical behind. The second is a Dursban spray. This does leave a residual control. Soapy water (one cup liquid soap/gallon water) is used when appropriate. All employees are trained applicators.

A second operation called S.A.F.E. (Sensible Alternatives For the Environment), has sprung up as part of this business, where people who are concerned about chemicals can have bees removed without pesticides. Prevention, too, is part of this business, and training people how to keep bees (and other pests) out of their homes before they get in has seen a steep rise in demand.

If there is a silver lining to the AHB for beekeepers, this kind of business – trained beekeepers performing a service for the community – Steve's business is it. BC

It's A Bear Market – These styles are commonly available from a variety of sources. Two are identical, (not counting the lids). Can you tell which two? Differences include arm position, fingers, stomach, tails and ears.

GLASS OR PLASTIC

Ann Harman

What Does The Future Hold For Honey Containers?

For 6,000 years, glass has been one of mankind's most versatile materials. It can be tinted every color of the rainbow; it can be as clear and transparent as, well, as clear as glass. It can be blown, molded, or spun into fibers. It can serve as a delicate perfume bottle or as a mammoth mirror for a telescope.

Although the first uses for glass were strictly decorative, it eventually became extremely useful as a container. Yes, it breaks when you drop it, but so do ceramic containers. Glass holds its special place as a container because it displays the contents as they really are. In fact, a glass container adds its own bit of sparkle to enhance the contents.

In recent years, however, plastics have begun to take over the ancient uses of glass. Although the first plastic containers were suitable only for certain uses, the advances in types of plastics and molding techniques are giving plastics the advantages of glass – usually without the danger of breakage. Let's face it, after 6,000 years, glass may revert to its original use – decorative ornaments.

Glass jars were perfect containers for liquid honey. Glass showed off the myriad colors of honey and contributed that extra sparkle to make the product appealing. Jars were especially manufactured to hold exactly one pound of honey and styled to show off the product.

When plastic containers for honey first appeared, they seemed the perfect answer to some common problems. The plastic jars were certainly lighter in weight, thus lowering shipping charges. The plastic was transparent, so the beauty of the honey could be seen. Unfortunately, the plastic was thin and soft enough to deform – the jars leaked. The plastic squeeze bears fared better. Their only drawback was that the translucent plastic did not display the honey to advantage. But the charm of the cute bears overshadowed that problem.

Last year, beekeepers who produce chunk honey and creamed honey discovered that their straight cylinder glass jar, the one with a decorative band at the bottom, was gone. Really gone, not just temporarily out of production. Immediate choices were not so appealing. Opaque plastic tubs for creamed honey are available, but chunk honey relies upon the transparency of the container to advertise the product. Honey shows at county fairs and beekeepers' associations require transparent, untinted containers so the product can be judged. What will we be putting our honey into now and in the future?

Answers are not so easy to find. Certainly for the foreseeable future, glass containers will continue to be made. But the quality of glass manufactured in the United States may well be compromised. Glass manufacturers are required to use a certain percentage of recycled glass in their new glass. At first thought that does not seem to be a problem. But suppose someone accidentally put a broken ceramic coffee mug into the recycling bin. Mug material is entirely different from glass. The glass, along with the mug, gets ground up, melted, and molded, only the mug ceramic does not melt at the same temperature and mix with the molten glass. Now you have small specks of ceramic mixed into the molten glass. When this is poured into the molds, say for jars, the new jar is going to have mysterious specks here and there. Obviously, if too many specks exist, that jar can be taken off the assembly line. But since it is impossible to remove all unwanted items from the recycling bin or from the molten glass before pouring, our present-day glass jars are going to contain some specks.

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GLASS ... Cont. From Pg. 23

Another problem exists with the recycled glass. If all the recycled glass is container glass, the finished product should be uniform. However, not all recycled glass is container glass. So the finished product, made from a wide assortment of glass, has squiggly lines, bubbles, and assorted other imperfections.

Nothing, really, can be done about the problems with recycled glass. We need to accept those imperfections. Our honey jar labels will, of course, hide certain areas of the jars, but we need to display the beauty of our honey, not hide it behind huge labels. Honey show judges will need to cope with jars less than perfect.

What is the situation with the old queenline jars? They seem to be still available. Well, the molds for the 8-ounce, 1-pound and 2-pound, the 2-1/2-pound square and the 5-pound round jars were sold to Venezuela. A new problem presents itself – unreliable delivery. Surface shipping of the finished jars takes time and is dependent on the ships' schedules. U.S. jar distributors will continue to have irregular inventories, through no fault of their own.

Someone once said that beer is about the only thing that still comes in glass bottles. Just wait – beer will be making its appearance in plastic bottles. Up until now, plastic has not been suitable for beer since the gases that give beer its fizz pass through the plastics available today.

A variety of containers holding a pound of honey, in both glass and plastic are available.

Large Plastic Containers – L to R; 2-lb flat with bee; 2-lb. bear, 24-oz. bear, 24-oz. squeeze, 24-oz. skep. Others are available.

However, on the horizon is a two-layer plastic bottle for beer that will not let the gases transfer through. Will plastic champagne bottles follow? Perhaps. The consumer of today is much more accepting of plastic containers than he or she was just a few years ago.

The honey jars available in plastic today are a big improvement over those of years ago. Perhaps you have noticed the initials "PET" on recycling bins. This PET is an attractive, transparent plastic that is not easily deformed. Therefore, the containers will not leak honey. Besides presenting honey in an attractive way, these jars and bears can be microwaved a short time on a "low" setting. This feature allows consumers to reliquify crystallized honey as long as he or she does not overheat it. Perhaps a small label giving reliquifying instructions for plastics in microwaves needs to be used.

The translucent plastic used for bears and the skep-shaped containers is still popular. Its only real drawback is that the brilliance and the colors of the honey are dimmed. However, these containers, including the cylinder shape, seem to remain popular. Here again, caution must be observed if reliquifying in a microwave. Perhaps this caution is desirable. The honey cannot be overheated and scorched, thus ruining the delicate flavors.

Some honey containers are made of "K-resin." Although attractive, this plastic is softer than PET and thus will leak. However, with a pressure-sensitive lining in the cap, the leakage is stopped. Honey tends

The Bear Family. L-R 2-lb., 24 oz., 12 oz., 8 oz. Others are available.

Hex Jars come in several sizes. Used with a gold cap and elegant label, these command a special place.

to crystallize faster in K-resin containers because of the chemical nature of the plastic. If you are planning a longer shelf life for your honey, the PET plastic is a better bet.

Beekeepers who like to use recycled plastic containers need to be aware that plastics can absorb flavors and colors. Passing these on to the honey is detrimental and can lead to consumer distrust of the honey. New containers, suitable for honey, are preferable.

In spite of the differences in types of plastics, one problem is common to all. They will not withstand heating over about 165°F. This means that anywhere along your production line, whether in a kitchen or in a professional honey house, you cannot expose plastic containers to that temperature. Glass jars used for preserving foods will continue to be made as long as there is a demand from people canning vegetables and fruits. The processing of foods requires temperatures in excess of what plastic can stand. Perhaps in the future, newly formulated plastics will become suitable for home food preservation. Until that time, beekeepers who use canning jars will still be able to purchase them.

A new trend is appearing in honey containers. Beekeepers are beginning to market their honey in imaginative ways. Glass "salt-and-pepper" mugs give the consumer a chance to recycle the honey container into something useful. The glass hexagonal jar, especially with a gold-colored lid, gives honey an elegant appearance. Coupled with an appropriate label, the hexagonal jar filled with honey can command a premium price, particularly in gift shops. The tiny one- or two-ounce glass "sample" jars, round or hexagonal, are also popular. Several of these, filled with different flavors and colors of honey and packaged as a unit, attract consumers.

Unfortunately, honey does not fit the "pint-is-a-pound" measurement. Containers, whether glass or plastic, will need to be made especially for honey packaging, particularly if the traditional sizes of 8-ounce, 1-pound, etc. are desired. Such packaging for honey will continue to be more costly than for other products since the quantity of honey marketed in containers is much smaller than that of jelly and jam, for example. However, with good presentation and marketing, the cost of the container is easily absorbed by the honey producer.

It is difficult for us to predict the future of either glass or plastic honey containers. However, what we *can* do is keep informed and follow change. Creative packaging can only enhance the sale of honey. Those in charge of honey competitions need to be informed, also, and be willing to accept modern packaging. Competitions are, after all, designed to encourage marketing skills.

Whatever the container, I'm sure we all will agree that honey deserves the best! BC

Ann Harman is a honey expert and also writes our monthly Home Harmony.

Small Plastic Containers – L to R; 1-lb. flat with bee; 1-lb. Gamber shape; 1-lb. skep; 12 oz. tube; 12 oz. bear; 8 oz. bear; 6 oz. square squeeze.

L to R; 4 lb. Queenline; quart mason; 5 lb. round; 2 lb. Queenline; 2-½ lb. square, 1 pint mason, 1 lb. Queenline, 1 lb. round, 1 lb. comb/liquid, 1 lb. round.

A Window To The Honey Market

Larry Goltz

Now that my sixth season with local Farmer's Markets is winding down, it may be of interest to reflect on what has transpired over these years of selling honey to a cross section of the public. I have been fortunate to have established and maintained a fairly substantial clientele familiar with my brand. An additional set of buyers, who are either tourists or are local people who rarely buy honey or only occasionally attend the Farmer's Markets have contributed substantially to the volume of sales.

During the past two years, two different Certified Farmer's Markets have been operating in Redding, allowing me to experience contacts with two somewhat different groups of honey buyers. Our original Certified Farmer's Market, approaching a decade or more in existence, has been held in a suburban shopping mall. A second market, somewhat of an appendage of the mall market, has a different location from the shopping mall. Part of a plan to revitalize downtown Redding, this Market Fest as it is called, is held each Thursday evening between July 17 and September 25 from 4:30 p.m. to 8:30 p.m. The program features appearances by musical groups, and in addition, 16 sellers of agricultural produce, an array of craft merchandise, and other vendors.

Quite appropriately, the Market Fest is held in a newly renovated downtown park setting. In its second year of existence, it continues to draw substantial crowds. The same organization that oversees the mall Farmer's Market, the Shasta Growers Association, supervises the produce stands at the downtown location.

A larger volume of honey is usually sold at the Mount Shasta Mall Farmer's Market than at the Market Fest, the selling season being longer – from the middle of April to the end of October – although I do not sell continuously during this period. I usually market my first honey in late April from the manzanita crop; that is, if it does not fail to materialize, as sometimes happens. There then occurs an interval until the main crop from yellow star thistle is ready for harvest.

Since all agricultural produce sold at the Certified Farmer's Markets must be grown or produced by the sellers, I am restricted to the sale of honey produced by my own bees. Even with this stipulation, there are always two or three dozen sellers of produce present at the Saturday morning markets throughout the season. Some specialists – growers of strawberries, for example – have a relatively short selling period, but some growers, with a wide range of produce and an ample volume of production, sell throughout the marketing season. I sell only honey.

I consider my fairly modest marketing venture at farmer's markets an excellent opportunity to contact consumers and learn of the various likes and dislikes concerning our products.

I package my honey in half-pint and pint canning jars as well as in the 12-ounce and two-pound plastic bears. I package a limited amount in wide-mouth pints as chunk honey, and cut comb in plastic square boxes. I settled on canning jars as containers the past few years after finding them very satisfactory as to consumer acceptance. I think I benefit from the uniqueness of using reusable containers. Also, canning jars fit into the pastoral theme typified by the farm market concept. Packaging in canning jars appears to set my product apart from the commercial lines of honey. Should commercial packers of honey begin copying my style of glassware, I'll switch to their style of bottles to maintain

"Selling your honey at a Farmer's Market is a unique way to meet your customers face to face."

my individuality! Another benefit of using canning glassware is that I can obtain supplies at any of several local outlets, it not always being convenient to call at our bee supply dealer for glassware. I try not to carry over a surplus of containers from one season to another. I found that trying to rely on obtaining canning jars from private sources was unsatisfactory since most were of different styles (brands). I prefer using only unused canning jars.

Perhaps more interesting than the marketing procedures are my experiences with individuals who buy (or don't buy) honey. Despite the fact that I have fine-tuned my displays and salesmanship to my satisfaction, some buyers of produce show little or no interest in my honey display. Those who do look over my display but do not buy, usually give reasons that range from being very legitimate (medical) to some that are startling, to put it mildly. One customer, a European tourist, I later surmised, sampled my honey. Making a dour face, he asked if I had any honey that wasn't "sweet" and walked away. You cannot win them all, I have found. A young lady asked if I had any "lavender" honey. It took a minute or so to comprehend exactly what she was asking for. Evidently she had obtained such a honey in Oregon. Strange things come out of Oregon that we in California are not aware of, and vice versa. I remember visiting a perfume factory in southern France after World War II and experiencing the wonderful fragrance coming from the pressed flowers of lavender and other herbs. Bees likely work the flowers for nectar, and the honey must be truly unique, as must also be true for the honeys from peppermint and other herbs grown commercially in the Northwest.

I do my best to explain my inability to fill requests for certain honeys including clover, sage, fireweed, and buckwheat, all sources of which are out of the reach of our bees in northern California. I am continually surprised by requests for honeys with qualities that make me wonder if the plant named is really the source. I suppose concentrations of carrots, onions, safflower, sunflower, and strawberries produce the honey the customers occasionally request. I can vouch for the existence of "strawberry" honey, having once had colonies in the vicinity of a strawberry plant nursery several hundred acres in size. At one time another beekeeper brought to market in late Fall an almost black honey of rather indelicate flavor that he referred to as "blackberry" honey, probably because of its color. I don't know if any bramble honey contributed to its content or whether the strangeness was due to something other than the usually fair flavor and color of the nectar from the various species of *Rubus*.

Most discussions with retail customers center around whether the honey is "filtered," "organic," or "raw" and if the comb is "edible." I explain that filtering honey is an intricate process involving controlled heating and clarification that is beyond my capability. The term "organic" when used in the context of honey, is a misnomer, I explain,

Continued on Next Page

Enterprising Youth

I have been keeping bees and subscribing to your magazine for the past five years. I am now 16 years old and a junior in high school. I have between 20 and 25 colonies, and my honey yield is now around 1,000 pounds. Last year it was 800 plus. I get my package bees and queens from Ed Allen of Allen's Bee Ranch in Redding, California. He and his wife, Beverly, have gone out of their way to help me, including taking me through their bee yard and their queen-raising process when I was first getting started. My honey house is equipped with a Dadant Ranger six-frame radial extractor, and I bottle with the Dadant 300-pound bottler.

Enclosed is a photo of my honey stand on Main Street in Fort Jones, California. On the weekends, after the honey harvest, I load up our 1925 Ford Model T pickup truck with my honey and drive it to town, where I spend most of the day selling. Also, one of the local stores sells my honey. I find that the Model T is an attention-getter, especially with the older people, who are the majority of my customers. In addition to the bottled honey, I produce comb honey in the old-style basswood boxes that most people recognize from when they were younger.

Since I started keeping bees, I have been through both mite infestations, the wax moth, ants, bears, and most of the other problems that plague the beekeeper. However, by reading the *ABCs of Bee Culture*, your magazine, and especially Richard Taylor's books on beekeeping, I have been able to survive these setbacks and increase my honey output yearly. The proceeds of my honey sales are going toward my college education and my parents are going to match the funds I raise.

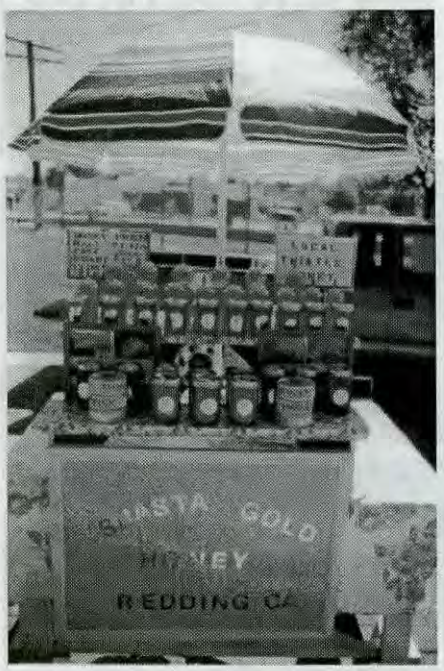
John Lindgren
Fort Jones, CA

WINDOW ... Cont. From Pg. 27

and in my opinion should never be used to describe honey. Others may disagree. "Raw" honey I can lay some claim to since in my simple methods, low temperatures (110-120°F), straining through a fine mesh cloth, and a period of settling in the storage tank produces a pack that rivals the commercially produced product in clarity. Our thistle honey contains a higher fructose content than most honeys, thereby resisting granulation, and is also lower in moisture content than other honeys therefore needing somewhat less processing.

I don't know how convincing I am when I explain that the comb in the chunk honey and cut comb packs is perfectly edible. If any of my statements are taken with a grain of doubt, this is the one that most often arouses indications of disbelief, particularly among the young who in many instances have never before seen honey in the comb.

Seldom does a market day go by without someone asking if my honey is "good" for their allergies. It is hard to avoid making either a positive or a negative statement on the subject without offending the sensitivities of the precisely scientific individual or the individual who wholeheartedly believes in the accuracy of such naturopathic treatment of common pollen allergies. I can only assure my customers that in all likelihood my honey contains "some" local pollens (if not placed there by the bees, likely present through "contamination' from cells of pollen during extracting). If someone is convinced that imbibing local pollen in my honey builds immunity to sensitivity to airborne foreign substances, who am I to say it is untrue? Sometimes it is hard to say "I don't know," which is really the truth.



My honey prices are usually somewhat lower than grocery store prices, which I can afford to do on the basis of having no intermediary and no promotional expense except a moderate fee paid to the growers' association. My honey stand is small compared to the usual spread of the other market people who need more space to display their often bulkier produce. I am fortunate in that I can prepare my honey days in advance of market and return the next week and even thereafter with unsold merchandise. This is a convenience denied to the growers of fruits, vegetables, and fresh flowers.

We have a fairly congenial group of sellers in the Shasta Grower's Association, although I sometimes jokingly refer to them as the Shasta Growler's Association. If names are not always remembered among the two or three dozen sellers, one can always identify one particular person with the pseudonym "strawberry man," "flower lady," or myself as the "honey man."

Meeting your customers face to face over periods of months, even years, inspires one to face the need for integrity and quality, although sometimes we may not live up to customer expectations, or appear not to do so. Once, to my embarrassment, a customer called to my attention the fact that the contents of a wide-mouth half-pint does not hold the same weight of honey as the regular half-pint jar. Fortunately I had sold only a few of the wide-mouth half-pints marked 12 ounces rather than eight ounces. The lady was not overly upset, and I expressed my appreciation for her calling this error to my attention.

A comparatively small percentage of American agricultural production is sold as a raw product direct to the consumer. Most agricultural production either requires processing or is sold in wholesale lots to speculators or direct to processors, sometimes being passed through several such middlemen before reaching the retail buyer. Naturally this adds considerably to the cost of the finished commodity, particularly when promotional agencies take a sometimes substantial slice of the marketing cost.

Is direct retailing of agricultural production antiquated? From my experience with honey and from watching the activities of various growers, I have mixed feelings about direct selling. Without a doubt it would be impossible, or nearly so, to retail our entire agricultural output in America.

What I have learned from my experience is that the benefits of commercial processing, handling, and merchandising of our farm commodities is by far the most efficient and perhaps only the practical method of keeping Americans one of the best fed among the world population. What we have learned about processing and merchandising our vast agricultural production has come about from what our ancestors learned from trial and error, then passing along this knowledge so methods and attitudes could match the growing needs and production of the present.

If there is one single reason for participation in genuine producer-to-consumer marketing, it is the personal satisfaction of having had a part in a process that is often so fragmented, impersonal, and costly that the consumer sometimes pays too dearly for what is, or has been, a fabulously abundant resource in America. Taking for granted such riches becomes, for each succeeding generation, an economic opiate, a population that is conditioned to believe that our food resources are infinite. Perhaps they are, but being acquainted with the realities of production, processing, and marketing of food can be an eye-opener for the complacent. Like exercise sports, the active participant receives far more benefits than the mere watcher and is much the better citizen for having passed through the rigorous training, conditioning, and participatory phases of sports than those who are interested in and care only about the final performances or product. BC

Larry Goltz is a former editor of this magazine, and now lives and sells his honey in Redding California.

How Honey Fits In
THE HEALTH AND NUTRITION DECADE

Joe Traynor

Wine Grapes, Tomatoes, Almonds, Pistachios and Honey – Just Some Of The Foods Being Promoted In The Latest Nutritional Fad

The 1990s may become known as the "health and nutrition decade." There has been a constant stream of reports – some backed by good data, some not – on the health benefits of specific foods. These benefits are aimed in general at increasing one's life span; more specific targets include cancer and heart disease prevention. The term "free radicals" of the protest-plagued 1960s has taken on a whole new meaning in the health-conscious '90s. Words like "beta carotene" and "antioxidant" are creeping into everyday conversation whether their meanings are fully understood or not.

The pig-in-a-python, baby-boomer generation of the 1960s eagerly laps up this health and nutrition information as it approaches the far end of the python. People who were considered "out-of-the-mainstream health nuts" in the 1970s now wear smug smiles as they discourse on the latest nutritional fad. Health food stores and organic produce are enjoying increased popularity even though half the goods sold in health food stores is of questionable benefit (and potentially harmful in some cases), and organic produce, besides being significantly more expensive, can be more harmful than "normal" produce (due to toxins produced by fungi that were not controlled by pesticides).

This new focus on health has had a significant impact on the food producing (farming) industry. A good argument can be made that the most significant event affecting agriculture in the 1990s was the *60 Minutes* program on the French Paradox – the fact that the French have a surprisingly low incidence of heart disease and cancer in spite of a high-cholesterol diet. The conclusion, since supported by research data, is that relatively high wine consumption is the key factor.

This program, and related stories in the media, set off a wine grape planting boom in California that is still going on. Wine grape prices doubled for many varieties, and prices for relatively poor land in optimum climate areas (for wines) jumped from $1,000 to $5,000/acre. When reports came out that the health benefits of red wine exceeded those of white wine, growers grafted white variety vines over to red.

At the same time the wine grape renaissance was going on, the health benefits of fruits and vegetables in general and broccoli and carrots in particular were being widely touted. Publication of the cancer preventing properties of broccoli and the beneficial effects of beta carotene in carrots spiked sales of these two vegetables to levels that still hold today.

More recently, tomatoes have gotten in on the act. One of the key components of tomatoes, lycopene, has been shown to significantly reduce cancer, more so than broccoli. Interestingly, processed tomatoes are more effective than fresh tomatoes as a lycopene source – a Harvard researcher reported a 40 percent reduction in the incidence of prostate cancer among male subjects who had five or more servings per week of processed tomato products. That's right, eat pizza to stay healthy! The California Tomato Growers Association jumped on this data and came out with a slick 20-page booklet summarizing the work of Harvard and U.C., Davis researchers (1). After giving my copy away, I called for a replacement, but the association was temporarily out due to overwhelming demand; the association is considering charging for the booklet when it is reprinted.

The almond industry has reams of solid data on the nutritional benefits of almonds and, like the tomato industry, will likely be publishing this data in booklet form. With a great-tasting product like almonds, there is some hesitancy within the industry to promote the nutritional aspects of almonds at the expense of taste aspects, but we'll probably be seeing commercials for almonds that stress nutritional benefits and end with the tag line "and they taste great, too."

On the lighter side, the Iranian pistachio industry is promoting their product to Russians by claiming that pistachios will improve potency in men. Undoubtedly this tactic will sell a few more pistachios to some gullible Russians but, with no solid data to back up their claims, any increase in sales will be very limited, just as the market based on unproven claims for honey is very limited.

Honey has been thought of as a health food for years and, as Jim Robertson has pointed out (August issue), *Dr. Jarvis' Folk Medicine* has been a tremendous promotional tool for honey. Unfortunately, Dr. Jarvis' book relies mainly on anecdotal tales rather than on hard data from hard research. Anecdotal tales on the health benefits of honey are lapped up by health faddists, but these health nuts represent a limited market and a market that is probably already saturated, or "mature," as an

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NUTRITION ... Cont. From Pg. 29

economist would say; further attempts to expand this market would be preaching to the choir.

A much, much vaster market is the affluent, better-educated baby boom generation, and this market has a "show me the data" attitude. As Mark Winston has pointed out (August issue), anecdotes just don't cut it in today's world. In defense of anecdotal tales, it must be said that they are often the precursor of good, solid research and, when proven to be sound, give their tellers the supreme satisfaction of saying "I told you so."

As to the nutritional benefits of honey, it has been accepted by most honey producers that their product is just another form of sugar. The infant botulism specter that was raised 20 years ago, and that still hangs over the industry in spite of the fact that a good argument can be made (proven?) that virtually any food is just as much of a botulism hazard as honey, has caused honey producers to be wary of over-promoting honey as a health food. It is not the nutritional benefits of honey that need to be promoted, but another well-documented benefit: its bactericidal effects, more specifically, its bactericidal effect within the stomach. It is likely that the bactericidal effect of honey in the stomach is the basis of much of the folk medicine lore on honey.

The bactericidal effects of honey have been known for years, but a relatively recent discovery has the potential of revolutionizing the honey industry just as much as *60 Minutes* revolutionized the wine industry. This recent discovery is that ulcers are caused by a species of bacteria, not by stress. The New Zealand researcher who proved, through painstaking work (a.k.a. research) that a bacterium was indeed the cause of ulcers, is a true hero who challenged the overwhelming conventional wisdom and endured widespread ridicule from the medical community when he first put forth the idea. Ulcers are now routinely treated with antibiotics, a treatment that can have undesirable side effects. It is not too far-fetched to imagine a time in the future when honey consumption will be the treatment of choice for ulcers as well as for many other gastrointestinal disorders. Many U.S. hospitals are encountering drug-resistant gastrointestinal bacteria. Shouldn't honey be on the menu at all hospitals?

In her encyclopedic book *Honey* (Bee Research Association, 1975), Eva Crane lists over 20 studies on the bactericidal effects of honey. In an excellent 1995 article, J. McCarthy cites 10 reputable studies on the bactericidal effects of honey, including its effect on harmful bacteria found in the stomach (2); there are, of course, many more such studies. My favorite study is, unfortunately, an anecdotal one, albeit one told by a respected professor: A man suffering from serious, possibly terminal, stomach ulcers embarks on a honey diet as a last resort and is miraculously cured (3). Such anecdotes will always be popular and can be looked at as the spoonful of honey that helps the medicine (dry research reports) go down. And, if you accumulate enough anecdotes, you have data.

Drug company representatives routinely visit doctors' offices and leave samples of their products along with research data touting the benefits of their wares. Why can't beekeepers in every community in the United States do the same – drop off a jar of honey at the offices of their local gastroenterologist(s) along with a two- to 20-page summary of a number of reputable research studies with a one- or two-sentence summary of each study? These summaries should be nicely laid out in an easy-to-read format and, for uniformity, they should be put together and distributed by the Honey Board. A footnote on each summary can indicate that copies of the cited studies (or extra copies of the summary) can be obtained by writing the Honey Board (assuming, of course, that permission has been granted by the authors or publishers of the studies to use their work in such a manner). Similar summaries (and honey samples) could be supplied to the local media. It might be best to wait until more information is available on the bactericidal effects of individual kinds of honey,* but a good case can be made for starting now.

I have a dream, a beekeeper's dream: that every household in America will keep their cupboards stocked with honey and that whenever even the smallest in the household should say "Mommy, I have a stomach ache" that person, no matter what color, what nationality, what religion; no matter, even, should that individual wear an earring in one ear or cut his hair in a manner offensive to his elders; that no matter what that individual's status within the hierarchy of the Family of Man, he or she shall be ministered to with the universally accepted remedy, honey. I have a dream that a day will be set aside each year as a time of prayer and contemplation on the part of all of God's children of this great nation; a day of homage to the role played by the midwife of this medicinal bounty: the American beekeeper.

*As McCarthy pointed out, different types of honey can have different bactericidal effects due, probably, in part to the amount of hydrogen peroxide in a given honey (2). Eva Crane pointed out that some antibacterial factors in honey can be destroyed by heating at 80°C (176°F) for 30 minutes. BC

Joe Traynor is an agricultural consultant and pollination broker from Bakersvield, California.

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Richard Bonney

Nosema

"Many beekeepers have not become convinced of the seriousness of nosema, and do not recognize the negative effects the disease has on a colony."

Nosema disease is probably the most widespread of all adult bee diseases. It is also a serious disease. Nosema substantially reduces the life span of individual bees and reduces their capability to work during that remaining life. The colony suffers, losing population, producing less honey, and often dying over the winter. When a serious infection from nosema is coupled with an infestation of tracheal mites, Winter kill is almost guaranteed.

It is probably reasonable to say that most beekeepers don't think of nosema disease as serious. In fact, in the earlier parts of this century, even researchers didn't consider it to be serious. They saw it as a problem for individual bees, but not necessarily for the colony as a whole. Such thinking persisted in research circles at least into the 1960s, and it affects beekeeper attitudes even today, in spite of the more recent understanding that nosema is indeed serious, and that it is responsible for the demise of colonies.

Subsequent to the 1960s, scientists began to realize some of the real effects of nosema on a colony of bees. A survey, made across 43 states, showed that 66% of the apiaries inspected had nosema present. Then, studies showed that individual infected bees can have their life span decreased by as much as 40%, and that infected bees are not capable of doing a full day's work during this shortened life.

Queens are affected also. As many as 15% of the eggs in an infected colony do not mature, and infected queens stop laying eggs and usually die in a matter of weeks. This is a possible explanation for many of those hives that go queenless for no apparent reason.

Fumidil-B is the only registered and effective treatment for Nosema. It can be purchased at any bee supply outlet. It is not inexpensive. It is cost effective.

What Is Nosema Disease?

Nosema is an infection in the ventriculus or midgut of adult bees, caused by a protozoan, a microsporidian parasite, called *Nosema apis*. The disease is found in bees worldwide but seems to have the greatest negative impact in temperate climates. This presumably is because the bees are confined for long periods during the Winter, with only limited opportunities to eliminate disease organisms from their bodies and from the hive. In warmer climates, Mexico, for instance, nosema is not as serious a problem.

Even in temperate climates, though, the incidence of the disease varies from year to year, from colony to colony, and from apiary to apiary. This can probably be attributed to a combination of factors, with colony hygiene and seasonal variations in weather and nectar flows being important.

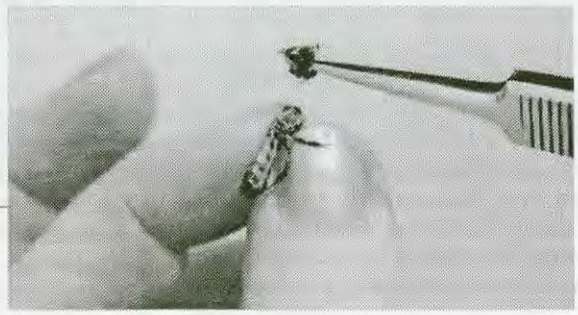
An individual bee first becomes infected by ingesting spores of the disease organism. In the midgut these spores germinate and spread through the cell walls of the lining. Once the disease is established, the

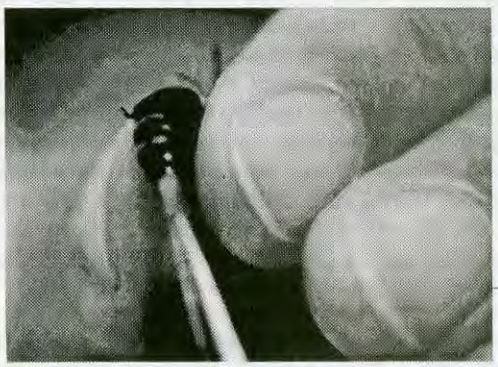
Continued on Page 36

NOSEMA FIELD TEST

Visual symptoms include bees unable to fly; quivering bees; spotting of top bars, bottom board or outside of hive; swollen abdomens; misangled wings; crawling bees. But the most distinctive *visual* symptom is internal – you need to take a close look at the midgut. You'll need a fine pointed forceps, a sheet of white paper, at least a couple dozen live bees, and maybe a hand lens.

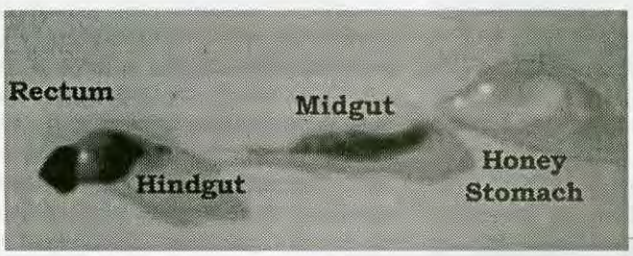
Select an adult worker from inner cover or entrance. Avoid young house bees. Grasp the live bee by the thorax between thumb and forefinger. With a fine-pointed forceps, remove the head at the base. This action severs the midgut from the head, making removal possible. To perfect the technique, practice on drones, initially.



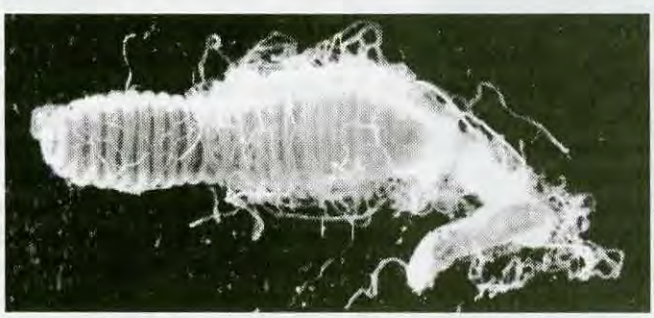


Turn the bee around and, holding the forceps at right angles to the bee's body, carefully and firmly grasp the very tip of the abdomen, *only* the last segment and the sting. Holding firmly, gently pull straight out. When done correctly the sting mechanism, rectum and hindgut should follow. Don't squeeze the thorax so tightly when pulling that you crush the insides.

Continue to pull as straight as possible, with steady but gentle pressure. First, the hindgut will be removed. Followed by the midgut, and finally the honey stomach. If you fail the first time, try again. Diagnosing *Nosema* is very important.



When the midgut emerges, hold the bee over the sheet of white paper so the entire system is laid out when completely removed. Observe the midgut. If healthy it should be tan, with the constrictions (wrinkles) obvious. If a heavy infection is present it will be white, bloated and no constrictions will be apparent. The color is the best *visual* indicator.



Magnified, a healthy midgut, left, is tan, and has obvious constrictions. Heavily infected midgut, right, will be swollen (comparitively) and white. A side-by-side comparison is best.

entire midgut becomes infected, and 30 to 50 million spores may be present. Up to 200 million spores may be found in the entire intestinal system if a bee is unable to void its feces.

Spores voided in fecal matter are infectious, and when deposited in the hive serve to transmit the disease from bee to bee. (Think of those dark deposits on top of the frame bars at the end of a hard Winter.) Young, newly emerging bees are disease free, but quickly become infected from these fecal deposits. Spores can remain infective for more than a year, and they are resistant to refrigeration, freezing, and microwaving.

All three castes of adult bees are susceptible – workers, drones, and queens. Proportionately, more workers are infected than drones or queens, but if the queen does becomes infected, her ovaries degenerate, egg laying is reduced, and she soon dies or is superseded.

In workers, development of the hypopharyngeal glands is affected, which in turn affects brood development as the bees are unable to feed developing larvae. Then, these infected workers age faster, and have a reduced ability to digest food. Eventually, after a shortened and less productive life, they will probably die of starvation.

SPOTTING, AND SPOTTING

Dark brown to black spotting or staining is often seen on the front of a hive after a hard winter. Yellowish or tan spotting is seen also after periods of confinement. The two are different.

Bees naturally and normally accumulate feces in their bodies when they are confined to the hive for extended periods. In healthy bees these feces are light colored – yellowish or tan. On the first warmish day after confinement the bees will fly out and void these feces, sometimes on the hive front, sometimes in the snow, sometimes on nearby white painted buildings or on laundry hanging on a clothesline. Such spots soon disappear from the hive front, presumably washed away by rain.

The dark brown or black staining is also fecal matter, but it is different and is indicative of a problem. Such deposits may be caused by nosema but also may be caused by dysentery. These droppings frequently build up in thick layers on the hive and do not go away easily. They should be scraped off.

Unfortunately, dysentery is misunderstood by many beekeepers. Dysentery in itself is not a disease – it is a symptom of a health problem usually related to the quality or source of the winter stores. Coarsely granulated honey, fermented honey, or certain forms of processed sucrose have been shown to cause dysentery. The basic problem that caused the dysentery can kill bees.

How Do You Know You Have It?

You cannot know positively unless you test scientifically. Nosema has no specific visual symptoms. Furthermore, in a colony the disease is cyclical over the year. Typically, the infection is low or undetectable in the Summer, has a small peak in the Fall, and rises slowly during the Winter. When brood rearing starts in the early Spring, the infection level rises rapidly. The rate of infection is related to the amount of confinement of the colony. As the population builds into the late spring the rate of infection tends to lessen naturally. The colony "outgrows" the problem.

What is happening, of course, is that the population is growing so there are more newly emerged bees to clean and polish cells and otherwise clean the hive, thereby removing disease organisms. This is happening while the colony as a whole is flying regularly, voiding feces outside and usually away from the hive. In effect, the bees are removing the source of infection and fewer new bees are becoming infected. Some level of infection always remains, however, to become a source of trouble later if the colony becomes stressed, whether it be from disease, food shortage, adverse weather, or anything that causes a significant reduction in population. While the bees are coping with these troubles, nosema creeps back.

Testing for Nosema

Today we have only one way to positively detect the presence of nosema disease in a colony of bees – by laboratory dissection and microscopic examination of a number of the bees, or of their fecal material, for the presence of nosema spores. This is not a procedure within the purview of most of us. However, there is a less positive procedure that anyone willing to handle some live bees can carry out.

Nosema infects and affects the midgut of the bee. The midgut of a healthy bee is straw brown, and the individual circular constrictions or corrugations can be seen. The midgut of a heavily infected bee is white, soft, and swollen and the constrictions are not visible. The midgut of less heavily infected bees may not show these symptoms. This leads us to the Nosema Field Test, described on the previous page.

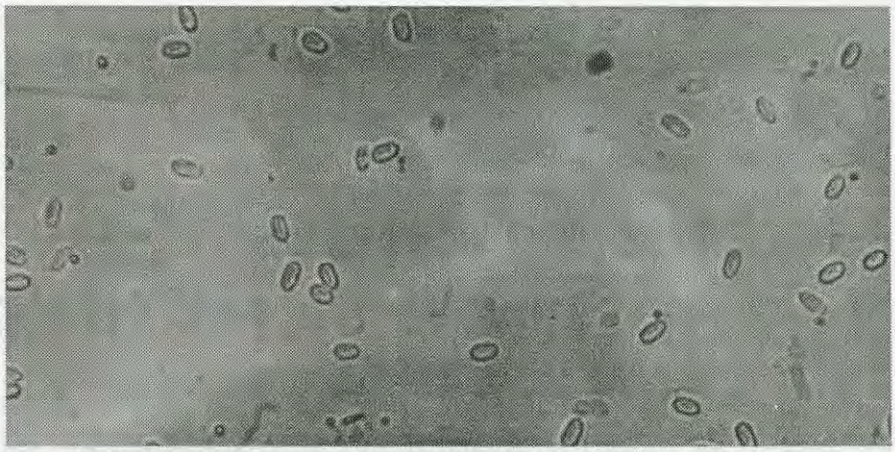
Mixing Fumidil-B

The medication Fumidil-B comes in powder form, and is given to the colony in sugar syrup. The powder can be difficult to mix into the syrup. When first added it just sits there on top. When stirred it tends to clump.

To make mixing easier, add the prescribed amount of powder (one rounded teaspoon per gallon of syrup) to a very small amount of tepid water in a rounded bottom container, perhaps a teacup. With a spoon, mash the powder into the water to make a paste. Add the paste to the syrup and stir.

Stir it again after an hour or so and you should find that the Fumidil-B has all dissolved into the syrup.

Not all bees in a colony are necessarily infected when nosema is present, nor will every infected bee have the same level of infection. Therefore, after field testing one or two bees and finding no apparent infection, keep testing. Inspect twenty or thirty bees at least and even then, don't be quick to declare your hive nosema free. This is not a scientific procedure. It is open to interpretation and statistics. The most you can say is that if nosema is present, it is at a low rate of infection. If the disease is obviously present, control it. If it is not obvious, control is still a good idea.



The only sure test for Nosema is checking the midgut or fecal material under a scope to see if nosema spores are evident. (Magnified about 600x)

Controlling the Disease

The first line of defense against nosema is the same as against any disease or stress. Keep the colony strong and healthy. Do this by several means.

- Requeen regularly, so that egg laying and potential population is kept at a maximum.
- Be willing to feed "out of season." Since brood rearing is dependent on an ample supply of food, either in the hive or coming in, be prepared to feed at any time there is a nectar dearth. Feed also if the colony has been weakened from any cause. This will allow the bees to devote less time to foraging, more time to house chores.
- Add a frame or two of capped brood to a weaker hive to boost the population of young bees who provide that ever important cleaning force.
- *Replace old, black brood comb on a regular basis, at least one or two combs per brood chamber each year. These black combs are repositories for disease organisms of all kinds.*
- Finally, be willing to medicate.

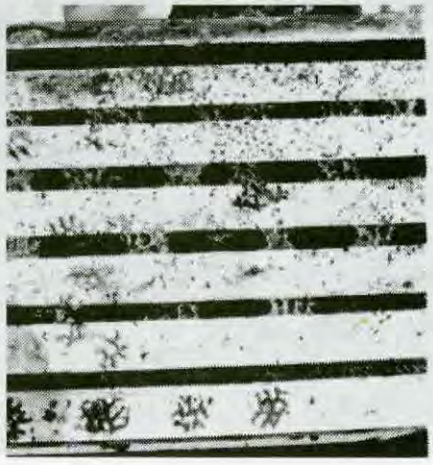
Treatment

Fortunately we have a medication – fumagillin – to use against nosema disease. This medication is available from bee supply dealers in the U.S. under the trade name "Fumidil-B", and is given to the hive in a heavy sugar syrup. When applied in the Fall, Fumidil-B represses infection in those bees already infected and stops the deposition of contaminated feces in the hive. The medicated syrup stored in the hive continues the treatment through the Winter. Two gallons of 2:1 syrup is strongly recommended as the effective treatment in the northern tier of the U.S. and in all of Canada.

In the fall the medication must be fed early enough so that the bees are still active and can remove excess moisture from the syrup. This is true, of course, for any syrup fed in the fall, not just that used in administering medication.

Beekeeping supply dealers with whom I have spoken agree that only a very small percentage of beekeepers buy fumagillin. Many beekeepers have not become convinced of the seriousness of nosema, and do not recognize the negative effects the disease has on a colony – less honey production, less pollinating capability, less likelihood of surviving a severe winter, and all of this compounded by the presence of mites.

There's spotting, and there's spotting. Left, spotting on top bars may mean trouble, especially if Winter has not been too severe. Right, severe Winters may result in few flying days – and cleansing flights. Dysentary, caused by long periods of confinement and perhaps less than perfect stores can also cause spotting, especially on the outside of the colony.



Some beekeepers react adversely to the cost of fumagillin. This is a false economy when weighed against the potential adverse consequences. On a per dose basis the cost is between $1.00 and $2.00 per colony, with the exact cost depending on source and quantity purchased (three sizes are available). At today's honey prices, that cost will be repaid many times over by the increase in production.

Just because you can't see it doesn't mean nosema isn't there. Be safe, assume you are amongst the 66% mentioned earlier. BC

Richard Bonney is the retired Extension Educator for the State of Massachusetts, and a regular contributor to these pages.

A Pest Is A Pest Is A Pest

James E. Tew

But the biggest pest in your bee yard may not always be the size of a bear.

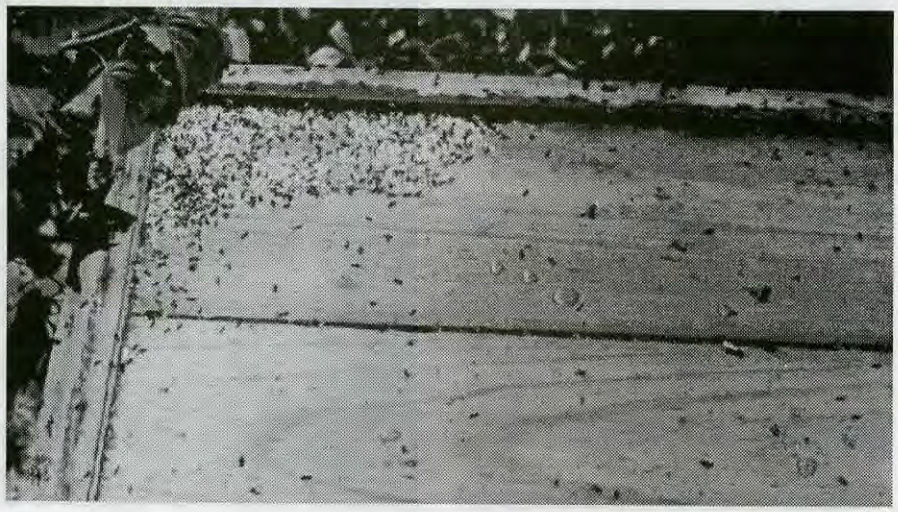
A honey bee nest is the department store of the natural community. Whereas fruit and berry crops come and go with the seasons, a well stocked bee hive sits there as a continual food and shelter beacon and is open all night seven days a week - almost akin to WalMart. Both immature and adult bees are excellent protein sources. Honey is an unexcelled carbohydrate source. Even dead bees are food for various scavengers. Pollen, wax, honey, larvae, the dead bodies of other hive residents - there is something there for everyone. No wonder that honey bees had to develop a defensive mechanism to protect its larder of food treasures.

Excluding pathogenic diseases, lots of other hive invaders would like access to the hive's shelter and stores. Is there a pest that rises to the top of the pest list? No doubt the current supreme pests are the predaceous mites that are attacking hives all over the world just now. Much has been written about them and much more will be written, but enough about them. Are there other pests that are ever bigger than the accepted big name pests? Yes and no. Occasionally, yellowjackets can be bigger pests than mice. But enough mice can be a bigger pest than an occasional skunk. However, a visit from a bear can make skunk problems look trivial. Therefore, one beehive's problem may be totally absent in another hive. So when is a pest truly a pest? You and the hive must decide.

Some Pesky Close Relatives

Yellowjackets. A beekeeper recently wrote the following comments. (loosely quoted) "I sat in front of my hive - just to observe for a while. Immediately, I saw a hornet enter the hive as if it were home. Another came along with the same behavior. I realized my Buckfast hive was being robbed. The robbers were the mean black and yellow hornets. They look like an elongated bee - but with shiny black and yellow bands. What should I have done?" Though Bald-faced hornets (*Vespa crabo* L.) are frequent hive robbers, the yellowjacket (*Vespula sp.* and/or *Dolichovespula sp.*) is a bigger villain and was apparently the insect being described. They take dead and dying adults as protein meals and are commonly seen in late summer and fall months when their adult populations are high. Surprisingly, they are not considered to be serious pests of the bee hive - in most cases. So, what should you do? Are they a pest or not? Normally, weak hives are subjected to predacity by yellowjackets. Can you determine why the hive is weak? If necessary, consider moving the colony to another location. A beekeeper recently told me of a concoction that he mixed up made from vinegar and sugar and was poured into a plastic gallon jug that had a large hole cut in it. Yellowjackets (and a few moths) were reported to be attracted to the baited jug. He hung these traps around the yard to attract the pests to the jug rather than to the hive. I've never tried this and can't comment on its effectiveness, but the price is right and the potential environmental damage is nil.

Ants on an inner cover can be more trouble for the beekeeper than the bees, especially if they bite.



Bald-faced Hornets, Bumble Bees and wasps. Bald-faced hornets (*vespa crabo*) are the only true hornets in the U.S. Though they will occasionally take a bee meal, as with yellowjackets, they are not considered to be a big culprit in this country. Ditto for bumble bees. Bumble bees (*Bombus sp.*) are frequently seen darting about near a hive but are rarely in numbers large enough to cause problems. Destroying the local nests of hornets and bumbles may offer some beekeeper satisfaction. But such actions have very limited effects and may be more harmful to the ecological system than simply living with them. Wasps (*Polistes sp.*) are even less of a problem. There's just not enough of them.

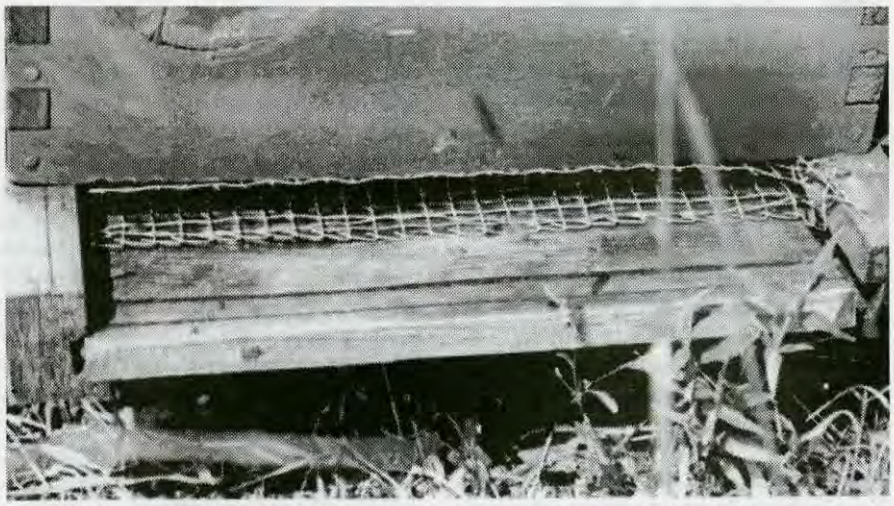
Ants. Ants are probably a bigger pain for the beekeeper than for honey bees, at least in our more temperate climate. Ants have been

called the "mice of the bee hive". It's hard to say how big a problem ants truly are. They have been relegated to a category that coyotes and armadillos also occupy. They seem to be bad, but it's hard to clearly show how bad. It's a common discussion at bee meetings - "How can I keep those big red ants out my hive? They've already killed one and have moved into another." That has the same ring as the wax moth statement, "The moths killed my hive!". I'll discuss wax moths a bit later, but both statements are more wrong than right. It is true that fire ants (*Solenopsis invicta*) can make it difficult for a beekeeper to work a hive without standing in a mound. It is also true that black carpenter ants (*Camponotus pennsylvanicus* DeGeer) will cut tunnels through woodenware - but do they really routinely cause damage to the colony? Probably not. Honey bees have a behavior that is not well understood where they will turn their rears toward the ants and then start up their wings thereby blowing a stream of air across the bees. Is the air stream laced with a pheromone or is it just a mechanical effort to blow the ants away? Even the odor of crushed ants have this effect on bees. Overall, though I don't like ants within the colony, there is not a lot of obvious damage in most cases. Anything that will kill ants will, more than likely, also kill or repel bees. I would suggest both you and the bees just live with them.

So what's the verdict on honey bees' Hymenopterous relatives - are they problems are not? Normally they are not serious problems for bee hives but they are a nuisance. Occasionally, novel situations do present themselves, but I would not label any of these relatives as major pests in the U.S.

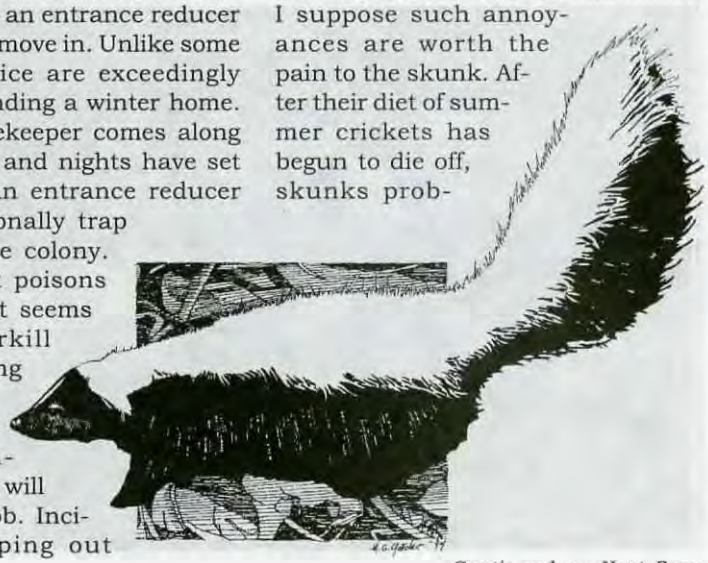
Furry Things

Mice. If ants are the mice of the bee hive, then what are mice within the hive? Caron (1990) called them the universal pest. A bee hive living with a mouse would be like us living with an elephant. "Disruptive" would be a mild word used to describe an elephant in my house or a mouse within a hive of mine. Mice eat it all. They feed on bees, pollen and honey. While eating and building their nest, they chew up equipment and cut up combs. Just when the situation can't appear to get worse, it does. In addition to all that feeding and living damage, they also urinate and defecate within the colony - giving everything the ambiance of a public restroom. During colder months, the mices' constantly partying causes the cluster to stay agitated and consume more honey. During warmer months, bees can defend the colony and send the mice scurrying away, but once the evenings begin to cool, the mice begin to look for a winter home. They're gone at first light and return again as the bees pull into a cool weather cluster. As the days and nights chill, the mice build their nests and make plans for winter without any interruption by defending bees. Unlike honey bees' pesky Hymenopterous relatives, mice are always bad. Can anyone suggest one good reason for having mice within the colony? Having agreed upon mice being a problem, what to do? The simplest action is to install an entrance reducer *before* the mice move in. Unlike some beekeepers, mice are exceedingly timely about finding a winter home. If the tardy beekeeper comes along after cool days and nights have set in, installing an entrance reducer may unintentionally trap mice within the colony. Though rodent poisons are available, it seems like an overkill when something as mechanical as an entrance screen or entrance reducer will do the same job. Incidentally, keeping out mice is the proper function of the entrance reducer - to keep out mice - and not to keep out cold air as is commonly thought. Put the reducer opening up, against the bottom of the hive body and not down on the bottom board where a winter's worth of dead bees may clog the reduced entrance. In essence, most beekeepers put the entrance reducer in "bottom-side-up". Queen excluders can be used if placed between the bottom board and bottom hive body but, again, watch for dead bees clogging the excluder.



Mouse guards, like this folded mesh, keep mice out, or in if they go in too late.

Skunks and Raccoons. These guys can be as disruptive as mice - only they are too big to crawl around within the hive. Of the two, skunks are the ones to watch. Raccoons seldom bother hives while skunks seem to make every effort to be disruptive. They apparently develop a taste for bees. Don't they ever get stung? All the time - especially in the tongue, palate, gums, and throat. I suppose such annoyances are worth the pain to the skunk. After their diet of summer crickets has begun to die off, skunks prob-



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PEST ... Cont. From Pg. 39

ably begin to eat dead bees in front of the hive. In doing so, they press down grass and weeds in front of the hive, dig small holes and stir up dirt.

No doubt the odors emanating from the hive finally entice the marauder to scratch the hive front to get to what smells so good. Out comes live bees. I suspect that from that point, our skunk is a bee-eater. So, what are the common signs of a skunk pest? Common signs are: (1) animal droppings in front of the colony, (2) disturbed ground, (3) skunk odor, and (4) dirty markings on the hive front. Another common symptom is an especially aggressive colony throughout the day. Over a short period of time, skunks and skunk families can cause serious damage to a colony. What to do? Good grief, everything short of an air strike has been suggested. Poisoning, shooting, trapping, or suffocation, have been suggested at times. I suspect the most rational thing to do would be to (1) raise the colony off the ground a couple of feet or (2) cover the entrance with a board or bricks. Rolled hardware cloth in front of the hive can prevent the animal from getting to the entrance. Frequently, skunks are not pests all year, but the part of the year that they are pesky are notable months.

Bears

Bears are the big name pests. Like mice, bears eat nearly anything. As Winnie the Pooh has taught all of us, bears like sweets - even to the point of having occasional teeth problems. They make a big mess of an apiary eating both honey and brood. They, too, take numerous stings and have been reported to, "howl in pain." Beekeepers have described bear "blow holes" usually found in soft ground or in base of vegetation. These are small holes that bears have dug to give their swollen nose a respite. Once bears have taken a liking to an apiary, they will return frequently until the apiary is totally destroyed. Many years ago, I and a friend had an apiary in Ontario that a bear took over for us. The destruction was total and equipment was scattered everywhere - even in the low branches of trees. The bear won. The common black bear is the one which usually gives beekeepers problems.

Bear damage occurs in specific areas of the U.S. and Canada. For most of us, bears will never make our pest list, but they present a special problem. In some instances, simply shooting the bear is illegal. As with skunks, nearly every type of control has been suggested - radios playing, traps, repellents, fences (both electric and non-electric), platforms, and voodoo dolls. Still, too often the bear prevails. There really is not a permanent solution other than to kill the bear which, as was stated earlier, could very well be illegal. I can't recommend doing anything illegal. Bacon rinds tied to electric fences seem to help deliver the best jolt to the bear - on the nose or tongue - and seem to make some bears reconsider the price to be paid.

Bears can do an incredible amount of damage.

I always thought that tying several bee hives together would be a practical answer, but many beekeepers report that the bear still gets in. Still, I would try that technique. In years past, bear proof platforms were built, but these are expensive and troublesome. For those beekeepers who think ants are a real problem, be thankful you don't have bear problems.

Other Bugs that Bother Bees

Wax moths are the uncontested worst bug to bother bees. Wax moths come in two varieties - the Greater Wax Moth (*Galleria mellonella*) and the Lesser Wax Moth (*Achroia grisella*), though other moths may occasionally be party to comb destruction. Wax moths' demands from life are simple - they want to eat any unprotected comb they can find. Dark comb is preferred. While the larvae are eating everything in sight, they will procure enough nutrients to grow and develop. If wood parts get in the way, they will normally eat through or around, leaving characteristic "scallops" in the wooden ware. Though stored foundation will be attacked, there is not enough foodstuffs for the moths to survive.

Wax moths are an old pest. Volumes have been written, innumerable remedies tried, and yet the moth persists. Anyone having seen antique bee hives may have noticed that, on some models, the bottom board is slanted toward the front. The primary reason for that slant was for "the wax moth larvae to roll out of the colony" should it fall from the comb. Fat chance. Wax moth infestations are dreadfully obvious. It is as though every spider in the county spun its web in your hive - but spiders are not involved in the least. The webbing is a product of the larval stage of the moth during its eating phase. Though contested, it has been reported that wax moth population, in the wild, provide a service. Any dead (ergo diseased) bee nest is scavenged by wax moths thereby scattering the disease inoculum so that future colonies in the same cavity will not be exposed to the same disease. I don't know, but I would suspect that a wax moth must be elated to find an unprotected nest - for whatever reason.

Your actions for controlling the

"WHEN IS A PEST TRULY A PEST?"

moths are limited and simple. Use paradichlorobenzene (PDB) on tops of stacked equipment (about six feet tall) preferably on screen wire. The fumes sink within the closed equipment and prevent the development of the larvae. Note that it does kill wax moth eggs. Keep PDB on the equipment all the time until it is to be used. Give it a few days to air. Do not use naphthalene which will accumulate within the wax. Though rarely practical, storing equipment in freezers will certainly stop the moth.

The best procedure is to keep strong colonies (as though you would do otherwise) and simply put the equipment back on the bees. "Let them worry about the moths". Unfortunately, there are no current silver bullets for controlling the moths.

Roaches. In parts of the U.S., these guys can be disgusting. They will completely take over the space between the inner cover and the outer cover or between the outside frames and the walls. They will occasionally be there in numbers by the hundreds. Though I can't imagine that they serve any good purpose by being there, there is no common problem associated with them (other than basic nastiness). Again, I suspect that the beekeeper hates them much worse than the bees. I don't know of anything that will keep them out permanently.

Human Vandals. Though they should probably be in a category by themselves, I have decided to put humans in the "bug" category . . . right there with the roaches. Vandalism defies logic. I once had someone run over some of my colonies. That could not have been good for their vehicle. Kids? Drunk? I will never know. I do know that many times vandals are (sadly) simply other beekeepers cutting competition. There's not much you can do. Camouflage the hives, put them behind fences - possibly even place them on a flat roof, but be aware that vandals aren't very predictable.

Lots of things want to live inside the bee hive other than bees. I have attempted to discuss some of the prominent ones, but there are numerous others that were not given space (Mocking birds, flies, earwigs, termites, praying mantids.....and on and on, but the realities are that most non-bee animals are little more than nuisances. Don't worry greatly about yellowjackets and hornets, but worry a lot about mice and wax moths. Avoid bears any way possible. As always, do no harm to your hives, but do try to help where possible. Ultimately, you will have to accept the fact that there will always be something unwelcome within the hive. Even pests have pests. BC

James E. Tew is State Specialist in Apiculture, The Ohio State University at Wooster, Ohio.

Morse, R.A. and R. Nowogrodzki. 1990. *Honey Bee Pests, Predators, and Diseases.* Cornell University Press. Ithaca, NY. 474pp.

Welcome To Draper's Super Bee

Kim Flottum

Nestled in the hills of northern Pennsylvania near Millerton, and about a mile off a somewhat traveled road sits an old red two-story barn, and a long low modern warehouse office complex. Welcome to Draper's Super Bee – beekeepers, bee supply dealers and honey packers.

Now run by Bill Draper, the business got it's start back in the mid-70s when his father found a swarm in the back yard. This seemed to go well with this retired minister's small farm idea – a barn, a cow, a pig, and now some bees. But by the end of that first year they had 75 colonies and were packaging honey in their house.

Bill was working in quality control in a machine tool factory at the time, but soon the call of running his own business lured him back to Millerton and the business of bees, and beekeeping.

Today, this progressive company runs about 1,100 colonies in 44 yards, packs about a million pounds of honey a year and delivers it from Washington, DC (The White House!) to Detroit, Michigan. They also sell bee supplies, fancy beeswax blocks and beautiful hand made observation hives, plus give facility tours to hundreds and hundreds of school kids every year.

The Bees

Bill runs Midnight and Starline queens exclusively. Midnights overwinter well in his climate, and the Starlines are superior producers, though they don't shut down fast enough in the Fall. All colonies are on pallets, and each of the 44 apiary sites have 24 colonies. Apiary sites are mostly close to home, the furthest being 50 miles away. Good records are kept for each site – for production, skunk and other pest problems, Winter kill and the like.

"It takes a few years to evaluate a site, but good records show how productive a site is. If it's not up to par, at least, we'll move it," Bill says "and since we have a waiting list of places that want our bees we can be a bit picky on where we put our bees."

Moving bees is the focal point of Draper's Good Neighbor policy. "We don't move if a farmer's working a nearby field, we don't move bees through town, we *do* remove swarms for people (ours or not), and we strive to be a good friend with neighbors, and even those not our neighbors," Draper says, and adds, "even though costs are high we do a little pollination for local people (small orchards and even homeowner's gardens), to keep that image."

The bee year begins in mid-January when yards are visited, some colonies united and bear fences brought in and repaired. By early March yard visits include cleaning Winter kills and moving honey between colonies to feed any needing it. Medications are put on the end of March.

In April queens begin to arrive, but first grass gets mowed, colonies get equalized and then equalized again. Each of the three deeps on every colony's brood nest is full of good quality worker comb.

"This is critical," Bill states, "because the more worker comb you have, the more workers *can* be produced."

Between 50 and 75 percent of the colonies get requeened after splits are made and colonies are checked again for strength and build up. They're equalized if necessary.

From May to mid-June honey is coming in, but it's used to build bees and more bees. By mid-June the colonies must be at peak strength. All during this time the queen has never been jammed, and has everything she needs to make the colony grow. All three deeps should be nearly full, because supers start to get added now.

Every yard is also routinely checked for mowing, bear fence repair, and bear damage. And, every colony has an excluder between brood and honey supers. Supers are being repaired now, too, because by July 15 everything has to be on and ready.

Mid-July is basswood time, and basswood is King. Every available super is on and ready before the anticipated date, (and maybe just a bit earlier). Weak or small colonies may even get a super removed to put on a stronger colony so not a drop is missed. Those supers may

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DRAPER'S ... Cont. From Pg. 43

get rearranged later, when the first flush is over and the weaker colonies have built up enough to need the additional space. Honey supers are all 9-5/8".

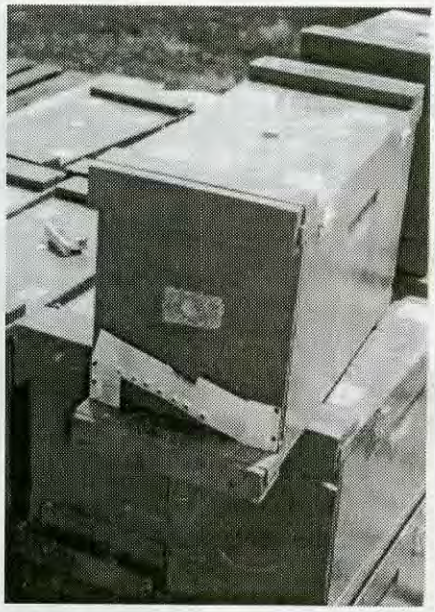
Full supers are removed if needed, but usually honey is only pulled once at the end of the season. The end, which is signaled by the first hard frost which usually takes out the last of the goldenrod and aster. Then, all the surplus supers are pulled and the extracting crew goes to work.

Yards located near people usually go last, when it's cold to reduce or eliminate bee-people contact. "Good politics," according to Bill.

Once everything has been pulled, and extracted, crews make the rounds for feeding, using a two gallon pail on top of brood supers, and medications are applied. Later, the colonies are put to bed until the January flush.

Meanwhile, extracting supers are inspected while still in the shop area and any repairs made, frames replaced or painting finished. When complete, supers are stored outside on pallets. Wax moth control is essentially unnecessary because of the weather (cold) keeping moth development in check.

Bill Draper is an intense, ambitious business operator, but enjoys his position immensely. A good beekeeper and salesman, he's also a good manager of the people he works with.



For making splits, Drapers use this unique nuc. The top is hinged and can be fastened in place. Ventilation is provided with screened holes, and a removable entrance guard.

The Bears

Bears are a serious threat to beekeepers in Draper's area, and the only way to survive is to keep every apiary equipped with an electrified bear fence.

"Bear fences are armed in January," says Bill, "because bears are changing. It's not uncommon to get hit in late January or February anymore," he said.

Draper's fence is pretty standard. Wires are 6", 18" and 24" off the ground. A 12-volt battery, kept inside the fence runs a charger that puts out 680 amps of 'jolt.' A bacon 'teaser' is kept on every fence. Fiberglass poles hold it all together.

Early raids are usually mothers and cubs. "The mother will break up supers and frames into small 'bite size' pieces, and nearly everything gets eaten," Bill said. But he went on, "they'll knock down the fence and move everything 100 feet, or 100 yards."

Experienced bears are easy to spot Bill said, because they knock over everything and leave. Then, the next night they'll return after the bees have abandoned much of the honey and *then* they'll eat. Inexperienced bears, by contrast, raid during the day and get covered with bees. Not a pleasant experience, usually.

Fence maintenance consists of battery checking, keeping weeds away from the wires, and fallen branches off the wires. Also, bears will drop into a yard from overhead branches, if available, so these, too, are removed if possible.

"The best bear defense is to never have a bear get a taste for bees, Draper says, "and a strong current, and the bacon teaser generally teach a bear not to bother them."

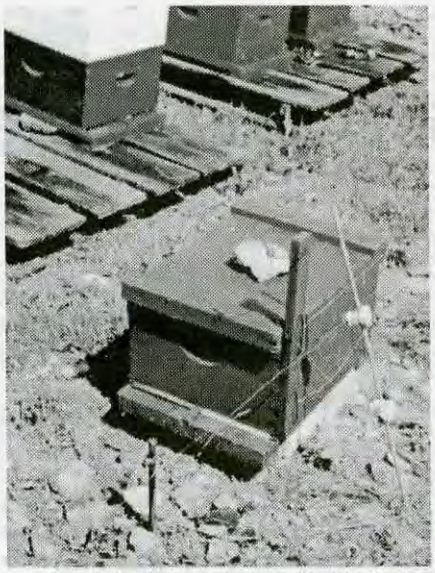
The Honey

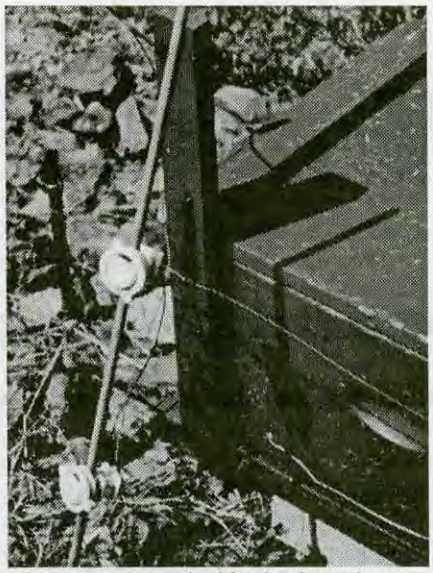
Draper's produces about 70,000 pounds of the million or so they sell each year. Extracted honey is immediately filtered and can be run into one of three holding tanks. From these tanks the honey can be bottled, run into pails or barrels. This facility can handle up to 20 barrels a day with a full crew and uninterrupted supply. They have a 110° melt room that barrels can be 'melted' in, emptied and run through the filter and into the tanks.

But to sell a million pounds of honey means Drapers buy a lot of other people's product. Varieties purchased include Basswood, Goldenrod, Tulip Poplar, Sourwood, Sourwood Chunk, Tupelo, Buckwheat, Clover, Wildflower and Orange Blossom. These are bottled in a variety of container sizes and styles. Retail containers have a UPC and Kosher label, while bulk sales go in 60-pound pails, 30-gallon or 55-gallon drums.

They also process their own creamed honey, using their own seed mix and Maxant filling equipment. Besides this, they have produced locally a honey mustard and

Bill runs his full sized colonies in 3 deeps before adding an excluder and honey supers. Colonies sit on pallets, but are moved individually.





Draper's fence set up. Left, the battery and charger super inside the fence in a modified super. Right, the fence, while not fancy, consists of fiberglass poles insulators and 2 or 3 wires. Every fence has a piece of bacon attached.

honey apple butter, plus, seasonally, honey popcorn balls.

All honey purchased, Bill stresses, is U.S. honey.

"We've tried some imported product on occasion," he said, "but the quality isn't up to our standards. So, even if we run short of a product from a domestic source now, we won't make it up that way."

Some Draper honey is exported, but only through a dealer, not directly. "We have so much demand right here I can't afford to ship it offshore," Bill said, and adds, "in fact we're always on the look out for good suppliers."

Draper will buy any amount of honey from a beekeeper. A 60-pound pail, container exchanged, to a truck load. They pay, depending on the size of the order, history of the supplier and time of year in as little as 30 days or less, or longer, depending.

"We make sure everything works for the beekeeper," says Bill, "and will even turn down loads sometimes when size and payment requirements are difficult for us.

"I'd rather have a satisfied, repeat supplier than try to do something I know I can't do. Most beekeepers are happy with an arranged payment schedule that spaces out the payments. That way everybody wins," Bill said.

Honey is sold a variety of ways. Direct sell customers have a delivery schedule made to their area and can call an order in, or Draper's will touch base with them before delivery. Two large vans are on the go continuously making deliveries. They deliver to specialty stores, farm markets (an expanding business), health food stores and bakeries.

The five-gallon containers used at Draper's is a square pail, stackable with a recessed handle. The spout fits the commonly available plastic gates.

Draper's does some private labeling, that is putting someone else's label on a jar they pack, especially for the variety honeys. They also sell bulk to small bakeries in 30-gallon drums (easy to handle), and in 60-pound pails.

The Wax

Beeswax is a natural byproduct of this business, and Draper's handle theirs, and that of other beekeepers with a conventional rendering system. A Kelley press makes the first pass, but the rather crude product is further refined in a fairly sophisticated system.

Crude wax is placed in the first tank, melted to 160°F and filtered into a second 160° tank with a double baffle, then into yet a third tank, at 160° and final filtered. From there it is poured into molds. They can handle about 300 pounds in a day, and make one pound and eight ounce blocks, which sell for about $3.95 per pound.

Bee Supplies

Bee Supplies are available at Draper's on a walk-in or mail-order basis. They send out price lists periodically (catalogs are expensive, and price increases or decreases occur throughout the year). Selling mostly wood goods, they have a little of everything.

Their most unique items are the observation hives they have. Large (three-story), well made on a rotating base, these are the Cadillac of the trade. They also handle package bees for local beekeepers. The delivery vans, when in the southern regions of their area pick up packages on predetermined days and have them available for preordered customers.

All The Rest

There's more to this company. The gift store that handles the bee supplies, honey and other products they sell and even the business office where Bill's now-not-quite-retired father still mans the phone, and where others field orders and handle other business.

And there's the school tours with thousands of local, and not-so-local children learning the basics of bees, and beekeeping.

Foremost among all of this is the philosophy of the company that everything – beekeeping, honey packing, wax processing, sales, tours and bee supplies – is a team effort. Everyone of the 10 employees has a contribution to make, and the team needs every contribution to be a success.

It's a philosophy that works at Draper's Super Bee. BC

Our Bee Club
LEARNING AND WORKING TOGETHER

Don Jackson

Beekeeping is more complicated than it used to be. It's important to keep learning as much as we can, whether new or old to beekeeping.

It is important to learn all we can. Beekeeping is more complicated today, but the challenges and the joys are still there. Our active local bee club has helped fill a vacuum in central Minnesota, to help beekeepers and would-be beekeepers to overcome the difficulties, to learn, and to share the joys. We made this our challenge to the nation's beekeeping industry, our contribution to overcoming the difficulties, and to help keep people in business. Members of bee clubs like a chance to learn something new about bees, and their favorite "sport" is working their hives. Of course, all club meetings since time immemorial have been meeting grounds for fielding solutions to beekeeping problems, and I suppose it will always be that way.

For a while our local club periodically would set up its meetings at members' own apiary sites. That was educational in itself, and the change in scenery was always welcome. But you know, often, very often, those meetings became showoff sessions. I don't know why the human being has such a strong tendency to boast about his own stuff, but that's the way it is. There was only one way to fix it, and that was to set up a club apiary, one where all the members would actually be co-owners and have a chance to use their own hands at each step of the way and through all the seasons. That stops the bragging in a hurry as all get serious about doing a good job from which the whole club benefits. This hands-on approach is also the best learning tool for beginners.

We started our club apiary project in the Winter. Winters in Minnesota are long, and once the holidays are past, you need something else to think about. At that time of the year, the mind seems to play tricks on you, and all the mistakes, errors, and disappointments of the past disappear, replaced by a sanguine planning for the bee year ahead. The imagination may run wild, and it is a great time to involve club members in a new project.

All that untapped energy and the hopeful anticipation of Springtime and a new season gave us well-attended meetings and lots of available help. New beekeepers were especially anxious to get their hands into the real stuff. One of us donated hive bodies for brood boxes; another, covers, bottomboards, and hive stands; and a third let the club use one of his former apiary sites. A fourth person took charge of getting the Natural Resources Department to help us build a good, energized fence for bear control; a fifth person offered queen excluders and honey supers; and many pitched in to paint and repair equipment, cut brush at the site, and do all manner of manipulation for the duration of the club project, from installing bees to removing and extracting honey, to feeding and wrapping up for the inevitable Winter ahead.

The group also wanted to try several different strains of honey bees at the same apiary. Suppliers too often advertise as though their own stock is really the nation's best, and you know how the story goes – someone else can always claim a better crop from his strain instead. "Whose bees should I order? Which are the most gentle? Which produce the most honey?" Or, for those who have been in the business before, "Why did my bees die last Winter? Am I using the wrong breed for Minnesota? Why didn't I get much honey? Some say that their bees don't have mites – is that true?"

Our bee club knew that we couldn't try every bee breed on the market, but we thought it would be fun, and even perhaps of value, to try several on the same location. A number of members did have their favorite suppliers, and I, for one, really tired of hearing others claim the superiority of their own breeds of bees. After a while it just gets to be a big ego trip, at the listener's expense, so we decided that the only thing to do was to order several breeds from different suppliers and give it a whirl. That didn't help the beginners decide where to get their own bees in the first year, but later, after trying several kinds of bees and seeing the differences, our club put together a group order of packages from one particular outfit. Everyone was able to purchase the bees at a reasonable price and have some idea of what those bees would be like to work with and how they would produce and Winter over.

Now came the interesting part. After wrangling around for a while, our club decided on 20 packages, using five breeds: Buckfast, Italian, New World Carniolan, Caucasian, and the recently released Yugoslavian strain of Carniolan. In late April of the Spring of 1995, the packages came in the mail, and a crowd of beekeepers showed up at the prepared apiary site to install them. Some came with hive top feeders and syrup, some with smokers and hive tools, and most with veils and gloves. I always find it interesting, though, that there are always individuals at these meetings who apparently do not believe in any protection at all, not even a bee veil.

I've heard of blindness from a sting in the eye! We had to be very specific: Bring your own protective gear because our club could not be responsible for the consequences of no protection. Most chose protection!

This article is supposed to be about education. Most beekeepers want help, and they need opportunities to learn from each other. Some came to the package installation meeting to learn how to put packages into hives of their own back home; others came to watch, to help, and to see that it was done right. Everyone needing the experience got a chance to actually handle at least one package of bees, to remove and release the queen, to open the cage and shake the bees into the hive, to learn not to be afraid of handling the little critters. That one session set the tenor for the duration of our club apiary project: hands-on, learning by action rather than words, do-it-yourself-with-expert-guidance-at-hand.

The packages eventually all got installed, though some came a little later, requiring extra effort by one family. And you know, we all felt good about it: There was a lot of bantering around, a great deal of camaraderie, and a sense that maybe the beginners weren't the only ones who would learn from a club apiary project. It's funny, too, in a group of people like this, that there are some who may try to assume a "bossy" role – they don't get by with it. There are always differences of opinion and several methods of doing each project, and the normal give-and-take exchange between individuals makes for a really healthy session. Just as an example: When you put in packaged bees, which is better – to directly release the queen or to poke a hole through the candy and let the bees release her? Actually, two years later, I removed the cork from one end of the cage, put one of those miniature marshmallows into the hole in place of the cork, and let the bees release the queen by chewing out the marshmallow, giving me 100 percent acceptance. Now, I'm a commercial beekeeper, but the marshmallow idea came from a hobbyist with just four colonies – who says we can't learn from each other?

Bee clubs may spend much of their planning time figuring out how to make the next meeting interesting. Our apiary project automatically did this for us. The natural rhythms of the passing seasons of the year made their own demands on our attentions, and everything just kind of fell into place for the duration of the club project. Beekeepers everywhere are familiar with these tasks, but since they needed to be done by the club, and since we had a number of people new to beekeeping, it was good to focus our meetings on these jobs for a while. We began scheduling our monthly get-togethers at the apiary on Saturdays, and this ate up six or seven months of the year. When only a few hands were needed to prepare for the next outdoor meeting, a few of us would get together and get the bees or the apiary ready ahead of time. It all went quite smoothly, and we were careful to make sure that everyone who wanted to know how to do this or that would have the opportunity to be a part of the scheduled task at hand.

You can visualize how our club set up this apiary, from gathering equipment from members and finding a suitable site to deciding which bees to order and installing the packages. What came after that was routine maintenance for many of us, but those learning found what we were doing to be invaluable. Just consider a few of the tasks which might be taken for granted by the experienced but which must be learned from scratch if one is just starting out:

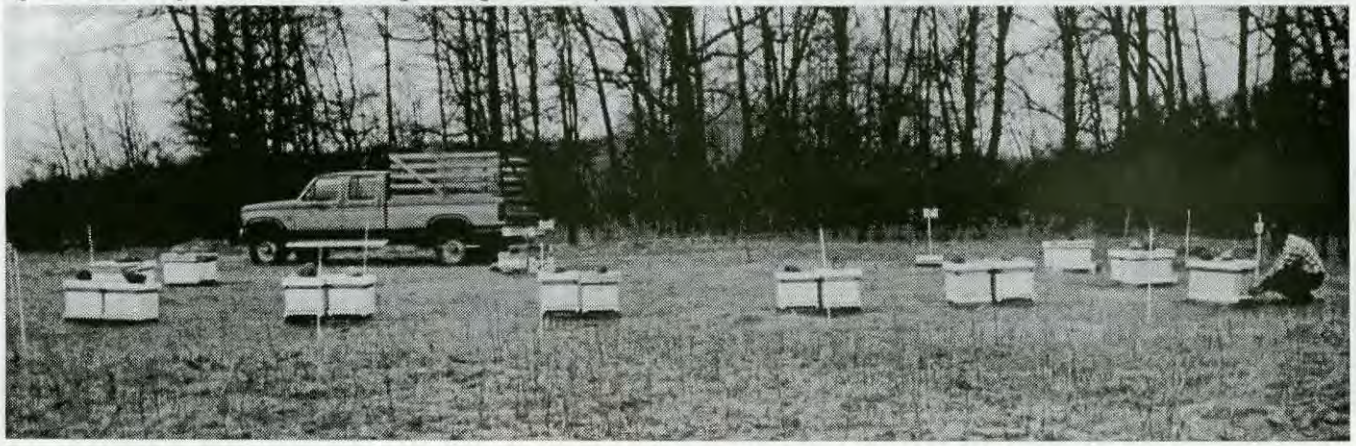
• After each package was shaken into the hive, it had to be fed. We used two methods of feeding: hive top feeders and friction top pails. What do you feed? We used corn syrup, medicated with Fumidil-B. Later we would use sugar syrup, and the newcomer needs to learn how to prepare that, too.

• As the Springtime progressed, the bees needed to be monitored for queen acceptance, brood quality, and food stores. Some packages lost their queens and brooded up with laying workers. It was a major hurdle for the novice to recognize the erratic pattern of laying worker brood, or to know how to move the ailing box of bees from its setting, shake all of the insects off of the frames (including the laying workers which are too heavy to fly back to the original setting), place the box of combs back on its original setting, and add a new queen. It all seems so very complicated until one actually does it and finds out how easy it really is.

• How do you light a smoker, and

Continued on Next Page

A view of our demonstration apiary in April, showing the excellent "energized" fence supplied by the Division of Natural Resources. (photo by Rose Zak)



LEARNING ... Cont. From pg. 47

what do you use for fuel? How do you use that smoker? How many puffs of smoke, and where do you apply it?

• How do you open a hive to examine it? You don't want to kill the queen when you pull out the combs – simple things like taking the first frame of a super from an outside edge demonstrated the solution to this problem.

• Where is the queen? Sometimes she can be difficult for even the professional to spot, especially if she isn't marked. The untrained eye always needs help at first. If one wonders if the colony has a queen, or if the queen is a poor one that should be replaced, a quick perusal of the pattern of her laying behavior will give the answer even if she cannot be found. The 20 queens in our club apiary were unmarked, but there was plenty of experience there to look for queens when they needed to be found.

• How about medication? How do you treat for foulbrood? Nosema? *Varroa* and tracheal mites? Chalkbrood? How do you recognize these diseases and pests when they occur? We had problems with all of them in our club apiary, most within the first month and a half of the bees' arrival. All got to see American foulbrood, chalkbrood, *Varroa* mites, and eventually tracheal mites (under a microscope).

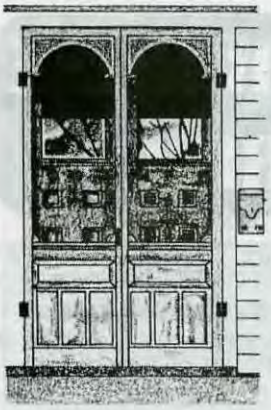
• When do you add second stories? Queen excluders? Honey supers? And how do you remove and extract the honey? How do you sell it?

• How do you prepare bees for the Winter and wrap them up? Do they need to be monitored during the Winter? When do they get checked in the Spring, and when do you unwrap them?

These are a few of the major tasks we covered in the first season. There are experts in our club, and they did a good job of helping demonstrate the "how-tos" of beekeeping. The altruistic nature of a club project was good for all concerned, a seasonal education for the novice. Next time I'd like to go into more detail about some of the usual – and unusual – things we did with our project. You'll see how beekeepers came to be mentors and teachers of this tricky profession, and how we took time as a club to try some things we may not have had time to try in our own home apiaries. BC

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

Some of our club members visiting before lunch at the club apiary after checking the bees in early Summer. (photo by Rose Zak)



Ann Harman

Home Harmony

It's Wild Game Season!

It's that season of the year. No, not holiday season yet. But hunting season is opening in most states, and beekeepers are enjoying their Fall and Winter hobby. Both beekeepers and hunters are wonderful cooks and probably have favorite game recipes already. Do they contain honey? I hope so. If not, perhaps you can find a recipe here to try out.

I am certain that each year someone goes hunting for the first time. Whether it is for game birds or small or large game, some preparation and cooking information may be of help.

Unlike meat purchased at the supermarket, that of a game animal is not under anyone's control. Those birds, squirrels, deer, and bears eat what they want whenever they find it. They fly and walk and run. Therefore, factors such as age and diet influence the palatability of game. In addition, the care of the game in the field is important.

The choices of foods do govern the taste the meat may carry. In general, the animals who are vegetarians have better flavor than those who are meat or fish eaters. Foods such as corn, acorns, pine needles, fruits, and seeds all contribute distinctive flavors to the meat.

It is impossible to select only young animals, but it is useful to be able to estimate age, even if only to differentiate between a young animal with more tender meat and an old one who certainly will be tough. This sort of information enables you to choose appropriate cooking methods and recipes. If you cannot determine the approximate age, assume it is old and tough. For large game, the rib and loin meat will be the most tender. Tough meat will come from the neck, leg, rump, and flank. For birds, the breast meat will be tender, but legs and wings may be small and sinewy.

I remember once reading a choice comment in a game cookbook to the effect that a male bear in mating season was not fit to eat. Perhaps that is another factor that governs flavor.

Game can be considered a very lean, high-protein meat. For accompaniments, tart fruits such as tart currant jelly, cranberries, or a not-too-sweet applesauce are delicious and robust vegetables are excellent. You may also wish to consider mushrooms, chestnuts, and brandied fruits.

To prepare the actual meat, marinades are essential. The most important function of a marinade is to tenderize; therefore most marinades contain an acid such as vinegar. Since game is lean, the marinade is frequently used to baste the meat during cooking or to provide the moist heat necessary for tenderness. Tough, old bear will benefit from marinating in an oil-based marinade for 24 hours before cooking with moist heat. Choose a marinade that will not overpower the flavor of the game, particularly the more delicately flavored. If you have a favorite marinade recipe that calls for sugar or brown sugar, just substitute honey to make it even better. Do not marinate for too long a time or the meat may become mushy. Marinades can be used to make a gravy or sauce to serve with the meat.

Small game, such as rabbit or squirrel, can be prepared with recipes for chicken. For large game, recipes for beef, veal, and lamb are useful. Recipes for pork work well with game, such as moose, that has more fat incorporated within the meat.

Perhaps the one most important task with any game is to remove all fat as soon as possible. The fat can contain off-flavors that may discourage some from eating any game. The sooner the fat is removed, the better the flavor of the meat. In the case of bear, fat that is rendered very fresh can be used for cooking. Otherwise, use it for waterproofing your boots. Now since you have removed the fat from the game, and the meat contains almost none, fat will need to be added during marinating or cooking or else the meat will be very dry.

Don't overlook the possibility of ground meat from your game animal. Ground meat does not have to be made into plain hamburgers all the time. Meatloafs, sausages, various meatballs, and filled or stuffed hamburgers can be absolutely delicious made with game. Fat can be added during grinding, which will give the needed succulence to the ground meat.

Cooking any game, whether small or large animals or game birds, requires attention. This is one time that you need to keep track of cooking time and tem-

peratures. I suppose it could be called old-fashioned cooking, since game should not be simply tossed into a microwave in the hope that it will be tender and tasty. Here are some marinades to try. You can adjust the ingredients for a particular meat and your own taste.

GAME MARINADE

By the way, game really needs the best ingredients. After all, you've put forth the effort in hunting, field-dressing, and generally taking care of the game. A little more care in ingredients and cooking will make game dishes a total pleasure.

1 cup dry red wine
1/4 cup lemon juice
1/2 cup olive oil
3 or 4 juniper berries or 2 or 3 sprigs rosemary
a sprig of parsley
a sprig of thyme
2 bay leaves
1 to 2 cloves garlic, pressed
a pinch of nutmeg
1 tablespoon honey
1 teaspoon salt
a dash of hot pepper sauce

Combine the above ingredients. Marinate large pieces of meat up to 24 hours. Makes 2 cups.

adapted from Joy Of Cooking
Rombauer and Becker

HONEY CILANTRO MARINADE

This next marinade is quite flavorful. It is suitable for birds as well as for small game.

2 teaspoons dry mustard
4 cloves minced garlic
2 tablespoons soy sauce
3 tablespoons honey
1/4 cup marsala wine or apple juice
2/3 cup minced fresh cilantro or 1/3 cup dry cilantro

Mix all ingredients and bring to a boil. Cool. Marinate meat for an hour or more.

Cooking With Honey
Marge Davenport

CRANBERRY HERB SAUCE

Here is a delicious recipe for a sauce that can be used with game. It can be used as a marinade before it is cooked down to a thick consistency.

2 small onions, diced
4 cloves garlic, minced
1 tablespoon vegetable oil
1 package (12 ounces) fresh or frozen cranberries
2-1/2 cups water
2 cups dry red wine
2/3 cup honey
2 beef bouillon cubes
1/2 teaspoon dried thyme, crushed
4 whole bay leaves
5 drops Worcestershire sauce
pinch rosemary
dash ground red pepper

Cook and stir onions and garlic in oil in large saucepan over medium heat until onions are softened. Add cranberries, water, wine, honey, bouillon, thyme, bay leaves, Worcestershire sauce, rosemary, and red pepper. Bring to a boil. (At this point, the cooled mixture could be used as a marinade.) Reduce heat to low and simmer about 1 hour or until mixture reduces by half, stirring frequently. Remove and discard bay leaves. Puree sauce in blender or food processor. The sauce will be the consistency of a thick gravy. Makes 2-1/2 to 3 cups.

Sweetened With Honey
National Honey Board

A HONEY OF A BASTE

This next recipe is a simple baste to keep the meat moist while baking or grilling.

1/3 cup rum
1/3 cup butter
1/3 cup honey

Melt butter and mix in rum and honey. Stir until blended.

Honey Of A Cookbook
Alberta Beekeepers Association

RICH HONEY PORT SAUCE

2 tablespoons olive oil
1-1/2 cups port wine
1 cup orange juice
1 cup dried apricots, cut into quarters
1/3 cup honey
1/4 cup minced green onions
2 tablespoons cider vinegar
1 teaspoon crushed, dried rosemary leaves

Rub meat with the oil. Combine remaining ingredients in large saucepan. Bring to a boil over medium-high heat. Reduce heat to low and simmer 5 minutes. Cool and pour over meat. Refrigerate for at least several hours. Use marinade as a baste during cooking or as the liquid for moist cooking.

adapted from Sweetened Naturally With Honey
National Honey Board

MARINADE

This next recipe is quick and easy. You can, of course, add any herbs you wish.

1/4 cup soy sauce
3 tablespoons honey
2 tablespoons red wine vinegar
1-1/2 teaspoons garlic powder
1-1/2 teaspoons ground ginger
3/4 cup salad oil
1 green onion, finely chopped

Combine ingredients and mix well before pouring over meat.

Don't overlook adding pieces of game meat to soups and stews containing other meats. The rich flavor of the game will enhance the mixture.

If you don't like game but do enjoy hunting, prepare the game meat and give to a friend along with a recipe for a marinade. Don't forget the jar of honey to go with your present.

Do you have any special requests for recipes, ideas for articles, topics you'd like us to cover or just plain comments? Please let us know.

Richard Taylor

Bee Talk

"A really good beekeeper is one who knows when to alter the rules."

I have often made the point that bees are unpredictable from one season to the next, and last time I suggested that beekeeping should be looked upon as an art and not, as some like to think, as a science. These two ideas are obviously connected. A really good beekeeper is not one who goes by fixed rules, but one who knows when and how to alter the rules, or even abandon them altogether in the face of changing conditions. And conditions are always changing for the beekeeper. No two seasons are the same.

The connection between nectar-secreting plants and honey flows is so obvious that you would think that here, at least, you ought to be able to manage things with predictable results. But don't count on it. In three different seasons I have had apiaries located in the midst of vast plantings of buckwheat and gotten not a drop of buckwheat honey in the hives. Once I had an apiary surrounded by acres and acres of sunflowers, and the bees made no sunflower honey at all. Whenever I come across a field of alfalfa in bloom near one of my apiaries, I check it out to see whether bees are visiting it. Sometimes there are lots of them. If I bend down, so as to be able to look across the field just above the plants, I can see a veritable cloud of bees over it. But then, at other times, I come across such a field, in full bloom, with lots of sunshine and good recent rainfall – perfect conditions for nectar secretion – and I can find not a single bee. It doesn't make sense. In all the many decades that I have kept bees, it has been considered an accepted fact that red clover is not a honey plant. The tongue of the honey bee is not long enough to reach the nectar, it is said. Bumble bees can work these flowers, but not honey bees. But this Summer, the editor of this magazine came upon a field of red clover covered with honey bees busily gathering nectar, something that I have never seen. Another beekeeper thought he had an explanation. He said that bees can sometimes get nectar from the second bloom of red clover, because then the flowers are smaller; but the nectar of the first bloom is out of their reach. That sounded pretty good, except for one thing: The field that the editor saw was in its first bloom!

And so it goes. There is just not an awful lot that you can count on from one season to another when it comes to beekeeping.

That conclusion was driven home to me again this Summer, certainly the strangest season for beekeeping that I have ever seen. We had our beekeepers' picnic at my house in July. The swarming period was past, I hadn't checked my apiaries for two or three weeks, and my spirits were high. I was sure the supers were pretty well filled with comb honey. They always are about that time of year. So the next day I went off to begin the harvest, only to find almost no honey at all! I had taken a dozen or so supers from one apiary earlier on, and now it looked like that was going to be about all I would get – a tiny fraction of my usual crop. And so it went, for the next few weeks. I have always considered it a settled principle to get my honey all harvested by early August, then do my mite control, and let the bees have all the Fall flows for Wintering. I have even called this "the Taylor principle," and given talks to bee clubs about what a wonderful principle it is. But like all rules, it doesn't always work. By mid-September, faced with an almost total crop failure, with almost nothing in bloom and even the goldenrod starting to dry up, I decided to just set the half-filled supers out for the bees to clean out and accept failure. But when I went around to do that, I found supers suddenly filled with honey! Where the bees got it I'll never know.

So now it is late September, and I haven't even done my mite control. We were told that we would pay dearly if we didn't get the Apistan strips in by early August. Well, my colonies are strong, they are finally making honey, and I haven't turned up any signs of *Varroa* yet.

The one thing you can be sure of in beekeeping is that you can never be sure of anything. The past several years, when we thought we were in danger of being wiped out by mites, turned out to give us the biggest honey crops in my memory. And then this year, when everything seemed to be starting out just perfect, I get a near failure in my honey crop – the first in my life. I'm not alone. Others around here fared just as badly. And yet, a beekeeper just 30 miles away got a wonderful crop, as did others, not much farther away.

Take what you get; try to adapt to ever-changing conditions; and don't imagine that you know all the answers or that you ever will. The bees will fool you every time. BC

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

Questions?

Evodia How-To

Q **I got seven seedlings from the Evodia seeds you sent. I Wintered the seeds in a freezer as instructed, planted them in March; they germinated in June, and the tallest is now about four feet tall. What do I do about fertilizing and watering them? Do they prefer sun or shade? And when can I expect them to bloom?**

Name Withheld

A I do not think they need fertilizer. I once killed one by fertilizing it, but they do need water. Normal rainfall should be ample. The trees do not bloom if the season is too dry. And they definitely need sun. If the trees are in the shade, they lean toward the sun. They will be several years old before they bloom, depending on Winter protection and health.

If A Tree Falls . . .

Q **If a single hive were located in a wooded area and the trees were all cut down but the hive left in place, would the bees be able to find their way home?**

Harold Gatlin
Crete, IL

A Bees are guided to their hive by landmarks, but yet, I have no doubt they would find their way under these circumstances.

Feed & Medication

Q **Can fermented honey be fed back to the bees? If so, can one add Fumidil-B, as one would with sugar syrup?**

Michael Strope
Horseheads, NY

A If combs containing fermented honey are set out near an apiary, the bees clean them out. I do not believe any harm to the bees would result from adding medication and feeding in a normal way, at least during warm weather, when the bees are active and can invert the sugars, as they do nectar. However, equal distribution of the Fumidil is questionable. Even with one hive, neighbor bees may help rob the honey. Best to medicate the recommended way.

Apistan & Mites

Q **I hear of beekeepers who leave Apistan strips in their hives all Winter. Is there any harm in this?**

Bill Prange
Stow, OH

A It is unlawful, the reason for this being that such a practice encourages emergence of a resistant strain of *Varroa.* This has already happened in Europe. I am aware, however, many beekeepers leave the strips in. They do not pose a threat to human health if left in, and when left in for only the recommended time, one is likely to find snow on the ground when it is time to remove them. So the temptation is to leave them there. The following account, from Mr. Williams in OH, is very instructive. When visiting his daughter in NC, he found one of her two colonies dead and the other very weak. He inserted Apistan strips in the one that was alive, and slid a white cardboard smeared with cooking oil in on the bottom board. The next day it had about a hundred mites on it. A week later he looked at the cardboard and found the mites still alive and moving about in the oil, showing that while Apistan will knock mites down overnight, it does not kill them. On another occasion he used Apistan in his own nine hives, then removed them at the proper time, with the exception of one weak colony which he did not think was going to make it anyway. This one had strips in all Winter, and, of the nine colonies, this is the only one that survived Winter.

Separate But Equal

Q **I have treated my colonies with Apistan and menthol. Question: Can combs exposed to these treatments be used in the future as extracting combs? Can they be used for next year's honey flow?**

Andy Kinghorn
Greenville, SC

A The use of menthol poses no threat of contamination to combs that will not be used until next year. Apistan strips should not be inserted into extracting supers, but must be inserted down below, into the brood nest, to be effective. Hence, since extracting combs and brood combs are thus kept separate anyway, and the former do not come into contact with Apistan, they can be used for storing honey to be harvested.

Winter Protection?

Q **Can you use mothballs to protect combs from moths over Winter?**

Fred Schwarz
Clark, NJ

A No, the napthalene contaminates the combs. Combs can be quite well protected by being exposed to light and fresh air, simply by setting supers on end. Once cold weather sets in, the combs will be protected by storing them in a cold place.

Native Bees

Q **Are honey bees native to North America?**

Dean M. Roberts
Turner, ME

A No one knows. Most of those who have addressed this question have decided they are not, this being based on a report from an early colonist that the American Indians referred to honey bees as "the white man's fly." This does not prove much. One writer has suggested it is unimaginable, somehow, that this vast continent could have bloomed for these countless millennia without the hum of the bee.

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

Richard Taylor
Answers!

INNER ... Cont. From Pg. 6

years preached on how to deal with the press so this very thing would not happen. And then it happens to us. In spades!

I've contacted both of the papers mentioned but I doubt anything will happen to correct the problem. It seldom does.

An acquaintance who writes for a nationally known financial magazine recently told me that Editors were genetically created to 'slash and burn' every writer's work. I'd like to think that some Editor somewhere in Iowa cut and slashed a paragraph to make room for a last minute ad in the paper, because a Publisher wanted more dollars. Not, as it seems, only careless reporting, and sloppy editing.

On the other hand, it's kind of neat to be able to say that you were misquoted in the *New York Times*.

•

The number of people who routinely read this magazine that contribute to the Honey Board are far out-numbered by those that do not. Not surprisingly, those who produce more than 6,000 pounds of honey each year are far out numbered by those that do not.

Nevertheless, it is my opinion that *everyone* who sells honey, whether out the back door, at farm markets, or to a wholesaler, benefits from the activities and research the Board conducts. Directly, or indirectly.

As you are probably aware there is a move afoot to change the format of the Board such that both honey producers, and honey packers will each pay a penny a pound handled to the Board. The additional penny from the packers will go to fund two areas of research. The first area is in 'preharvest' research, the second in quality assurance research. The price for this is that packers will receive an additional seat on the Board, replacing the public citizen position.

Herein lies the basis of a current disagreement between two groups of producers. One group contends that, yes, there is essentially no chance in Heaven that packers will actually pay anything at all and that producers will end up paying the extra penny, but that extra penny is worth the research to be gained. The second group of producers believes that because packers won't pay, (I don't think there's any argument here. Packers have little history of supporting beekeepers to any degree.), producers shouldn't pay another penny to allow packers two seats on the Board.

The makeup of the Board (not staff) now is 13 total members, consisting of seven honey producers, two packers, two importers/exporters, one co-op and one public member. The change, should it occur, increases packers by two, and eliminates the public member, thus increasing the number on the Board to 14.

There is a provision in the proposal regarding producer-packers, packers and importers who have their own advertising program. At present, the credit will cover up to 50% of their advertising costs, but the credit is limited to 50% of the *packer* assessment – the *second* cent. There lies a real problem according to some, and a deal-breaker according to others. The final rules and regulations have yet to be set.

But here's what's important. Real important. The legislation must first pass, and no matter it's rough beginning, a refining process *then* takes place. In fact, the process goes like this, according to typical congressional fal-der-all.

Day 0 – Legislation passed and is signed into law.

90 days later – Sec. of Agriculture publishes a proposed order in the Federal Register and asks for public comment.

240 days later – Final order published in Federal Register

60 days later – *Industry votes on the order.*

30 days – Referendum period (likely).

30 days – Time for USDA oversight to count referendum ballots.

15 months after legislation becomes law changes take effect, *assuming* industry approval.

Of course there are those who feel another penny is just plain too much to pay. And, with the way honey prices are bumping around that's a legitimate argument, perhaps. Some of this group have gone further, and feel that the Board should be promoting only U.S. honey, excluding the fee on imported honey altogether. Moreover, they feel the Board should be comprised of producers only. This would, of course reduce the funds available by nearly half, and reduce the Board's members by four (packers and importer/exporter positions).

This group suggests that, if packers want a promotion board they should form their own, assess their own and fund their own projects. The result would be, as I see it, two promotional groups, one pushing U.S. only (better by far than that adulterated, contaminated, cut rate, downright nasty foreign stuff), and one pushing honey, in barrels and bottles packed by a well known national distributor with fantastic name recognition.

Let's face it. If a packer has his own promotional board, whose honey is going to get the first cut for selling? And, if he chooses to promote U.S. honey, who pays for the (most visible) promotion?

And who, I ask, is going to benefit? Let's see. No research funds. Half the promotional dollars available for either group, and competition between these groups for market share, and a yet-further divided industry.

The hurdle that must be jumped here is to begin the process. Pass the proposed legislation and *then* make the compromising changes during the comment period. If not, if this balloon never gets off the ground the whole effort is for naught.

If the proposal dies due to petty differences and less-than-informed decision makers, the whole industry suffers. Those that think they gain, gain nothing.

Let the *process* begin. Then, let the discussion sort it out. After all, the *original* proposal met with *everybody's* approval at the meeting in Reno.

The Honey Board may not yet be the perfect organization, but it is better, far better than what would be left if this divisional proposal actually occurs. It is easy to tear apart. It is more difficult, but far more productive, to make what already is, better.

Make this happen. Then, make it work.

Kim Flottum

?Do You Know? Answers

1. **False** Unlike higher animals, the cells making up the blood of honey bees are not responsible for the transport of oxygen to the various tissues of the body. The primary functions of bee blood are the distribution of digested food materials absorbed from the alimentary canal, the reception of waste products of metabolism which are removed by the excretory organs and the transport of carbon dioxide to be eliminated through the respiratory organs and integument. Oxygen is supplied through a tubular system of tracheae. The fine terminal branches of the tracheae, called tracheoles, go to practically all cells of the body, thus tissues receive their oxygen direct without transport by the blood.
2. **False** Drone honey bees (male) have 13 antennal segments whereas the worker and queen (female) have 12 segments.
3. **False** The mandibles of the queen, drone and worker differ in shape and size, because they have different functions. The mandibles of the queen are larger than those of the worker and drone mandibles are smaller than those of the worker.
4. **True** The tip of a vibrating honey bee wing describes a figure 8. The flight movements of the wing are compound. They include an up-and-down component, a forward-and-backward component, and a partial rotary movement. A mere flapping of the wings cannot produce flight; the driving force results from a propeller-like twist given to each wing during the upstroke and the downstroke. As the wing descends it goes also somewhat forward and its anterior margin turns downward; during the upstroke the action is reversed.
5. **True** In most insects the thorax consists of only three segments, but in the bee and related insects it includes four segments. They are the: prothorax, mesothorax, metathorax and propodeum. The propodeum of the bee is the first abdominal segment of most other insects.
6. **True** The adult honey bee worker's body is covered with a dense coating of hairs. The bee's coat is particularly fluffy because many of the hairs are featherlike, the shaft of each having many short side branches which aids the bee in the collection of pollen grains.
7. **False** The proboscis of the bee is not a permanently functional organ as it is in most other sucking insects. It becomes functional by bringing together the free parts of the maxillae and the labium to form a tube for ingesting liquids-nectar, honey or water.
8. **False** The wings of the honey bee are attached to the mesothorax and metathorax.
9. **False** To insure unity of action, the wings are provided with a coupling apparatus formed by a series of upturned hooks on the front margin of each hind wing and a decurved fold on the rear margin of the fore wing. When the wings are extended in preparation for flight, the fore wings are drawn over the hind wings and the hooks of the hind wings automatically catch in the marginal folds of the fore wings.
10. The honey bee proboscis is used for: Ingestion of liquid materials (nectar, honey, water) Functions in food exchange between workers, workers and drones and workers and the queen. Lick pheromones from the queen
11. The sting of the queen is longer than that of the worker and is more solidly attached within the sting chamber. The shaft of the queen's sting is strongly decurved beyond the bulb. The lancets have fewer and smaller barbs than those of the worker.
12. E) Hind Legs
13. I) Antennae
14. D) Proboscis
15. C) Abdomen
16. I) Antennae
17. H) Fore Legs
18. A) Head
19. A) Head
20. 10 pairs of spiracles
    3 pairs on thorax
    7 pairs on abdomen

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

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17. Signature and Title of Editor, Publisher, Business Manager, or Owner: [signature] — Date: Sept. 25, 1997

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including multiple damages and civil penalties).

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3. Be sure to furnish all circulation information called for in item 15. Free circulation must be shown in items 15d, e, and f.
4. If the publication had second-class authorization as a general or requester publication, this Statement of Ownership, Management, and Circulation must be published; it must be printed in any issue in October or, if the publication is not published during October, the first issue printed after October.
5. In item 16, indicate the date of the issue in which this Statement of Ownership will be published.
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PS Form 3526, September 1995 *(Reverse)*

Gleanings

NOVEMBER, 1997 • ALL THE NEWS THAT FITS

APISTAN STRIPS UNDER ATTACK

From Wellmark International (formerly Zoecon) comes the following. It has come to our attention that there have been several reports of problems controlling *Varroa* mites. At this time, the problem appears to be localized to certain areas in Florida. We understand your concern about these reports and want to assure you that we are taking immediate steps to determine the cause of the problems.

As this letter is being written, Wellmark International is coordinating efforts to conduct tests in cooperation with experts at the University of Florida and the U.S. Bee Research Laboratory in Beltsville, MD. We expect the preliminary results from those tests in the near future.

Based on the information we have at this time, we have no reason to doubt the integrity of our product. As you know, Apistan has been used for nine years for the effective control of *Varroa* mites. However, we take the concerns about product efficacy very seriously and are working vigorously to determine the cause of the recent *Varroa* mite population problem.

We appreciate your patience as we work to find answers. In the meantime, I promise to keep you informed of any significant developments in the situation in Florida.

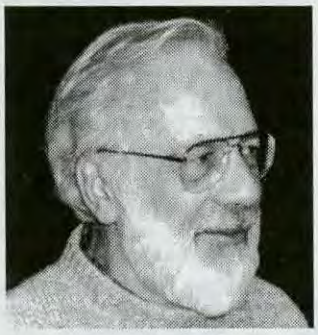
Meanwhile from the U.S.D.A. – Due to recent reports within the U.S. beekeeping industry which indicate that in certain localities Apistan® (fluvalinate) has reduced effectiveness in controlling *Varroa jacobsoni*, a meeting was held by USDA-ARS in October in Beltsville, MD. In addition to ARS scientists, the meeting was attended by individuals representing the Apiary Inspectors or America (AIA), the American Honey Producers Association (AHPA), the American Beekeeping Federation (ABF), and Wellmark International (formerly Zoecon). Preliminary tests by ARS indicate that this reduced effectiveness could be due to one or more factors including (1) decreased response by *Varroa* to fluvalinate; (ii) strip formulation; (iii) misuse of fluvalinate; or (iv) a combination of these factors. More detailed testing is underway to determine the scope of the problem, and work continues aggressively to provide the beekeeping industry with alternative treatments. Meanwhile, only Apistan® is registered for the control of *Varroa* and beekeepers are urged to continue using Apistan® in a manner *consistent with the label.*

BORDER STILL CLOSED

Agriculture Canada has agreed to the request of the Canadian Honey Council that no honey bees may be imported from continental USA for two more years. This agreement extends the current border closure until December 1999.

Tom Ross Retires

ROSS ROUNDS CHANGES HANDS



Tom Ross, president of Ross Rounds, Inc., the longtime manufacturer of Round Comb Section Equipment, is pleased to announce that ownership and management of the company is now in the hands of Lloyd Spear of Guilderland, NY. This move was made in the interest of assuring our customers of a continuing source of equipment. Spear is a knowledgeable and enthusiastic sideline beekeeper of long standing, with experience in the production of section honey. Also important, he has extensive business experience that will assure better service and continuity into the future.

Correspondence and orders should be directed to Lloyd Spear at Ross Rounds, Inc., P.O. Box 582, Guilderland, NY 12084, phone 518-370-4989, FAX 518-381-6370. Production and shipping will continue to be located in North Canton, Ohio, and Tom Ross will continue to be associated as a consultant, but the Massillon address and phone number are being closed.

Tom Ross extends greetings and appreciation to all dealers and customers, many of whom have become personal friends. He says "It has been a satisfying experience to attend meetings and meet people who use or sell Ross Rounds, and to connect faces with voices on the phone or names on letters. I am pleased to report that my association with customers will not end with this change of ownership, as I will continue as a consultant to Lloyd, and will be seeing many of you at future meetings."

Bonney Retires

MA LOSES EXTENSION

Richard Bonney, Massachusetts Extension Apiculturist, recently announced his retirement from both his Extension and teaching positions at the University of MA in Amherst, effective September 30, 1997. This ends a 19-year association with the University, and could conceivably be the end of a beekeeping presence in Amherst.

Umass, in its original incarnation as the MA Agricultural College, is thought to be the first school in the country to offer instruction in beekeeping. The first course was offered around 1868, soon after the college was founded. Although there have been short breaks in continuity, there has been a beekeeping presence almost continually since that inception.

Considering the severe cuts in budget and personnel that Cooperative Extension has suffered in recent years, it is unlikely that the Extension component of Bonney's appointment will be refilled. The future of the teaching component is yet to be determined.

Sugar, Not Honey Consumption Up

DIETS NOT WHAT THEY SHOULD BE

What we eat in America isn't necessarily what we think we should eat. That's the bottom line from ARS' most recent nationwide food consumption survey. Two-thirds of adults think it's very important to choose a diet with plenty of vegetables and fruits – as stated in one of the Dietary Guidelines for Americans. But their survey responses, collected in 1994-95, showed consumption of these foods has increased only slightly since the late 1970s. Fruit intake is slightly below the minimum two servings recommended in USDA's Food Guide Pyramid. Vegetable intake is only slightly above the minimum three servings. And, veggie consumption leans more to french fries than to the dark green and yellow vegetables associated with health benefits. On the other hand, while grains form the base of the Food Pyramid, less than one-third of adults think eating plenty of breads, cereals, rice and pasta is very important. But consumption of these foods has jumped more than 40 percent since the late 1970s.

Ninety percent of adults believe it's important to maintain a healthy weight. But 40 percent think they consume too many calories, and one-third are overweight. What's more, 28 percent of men and 44 percent of women report they rarely if ever exercise vigorously. Sugar and salt-sodium consumption also doesn't follow beliefs. Eighty-five percent of adults agree with dietary guidelines that advise a diet moderate in sugars. But Americans daily consume an average 19 teaspoons of sugar that is added to their foods – by beverage and food processors or by consumers themselves. These 19 teaspoons account for 15 percent of our total calories for the population as a whole, and a considerably higher percent for adolescents. As for sodium, men exceeded by two-thirds the recommended upper limit of 2,400 milligrams daily. That's from foods alone, not counting salt added at the table. Women's diets have less sodium than men's, but they still consume one-quarter more than the recommended limit from foods alone.

Almonds & Others Pleased

COMMODITY APPEAL REJECTED

In a victory for California almond growers, years of litigation challenging the constitutionality of market development programs of the Almond Board of California have come to a close. On September 15, 1997, the U.S. District Court dismissed the First Amendment claim in the Cal-Almond, Inc., case. This decision was issued just months after the U.S. Supreme Court set a precedent which supported grower funded advertising programs.

Board Chairman, Joe MacIlvaine announced the decision at the Almond Board's Administrative and Finance Committee meeting at the Modesto Centre Plaza on September 24, 1997. MacIlvaine stated that the almond industry is looking forward to getting back in the business of promoting California's number one tree nut crop. "The industry has been given the go-ahead to promote almonds and that's welcome news to California's almond growers. Increasing supplies on the horizon make this an opportune time to execute a program to increase the awareness and demand for almonds," MacIlvaine said.

Prior to the announcement of the Court's decision, the Almond Board's Information and Research Committee reviewed components of the industry's marketing plan for 1997-1998. Over $11 million in public relations, nutrition research, generic advertising, brand advertising and international market development programs are being launched to market anticipated larger almond crops.

A 400-mile stretch of land, from Bakersfield in the South to Red Bluff in the North, is home to California's almond growing region. Approximately 6,000 almond growers cultivate 465,000 acres. CA supplies approximately 80% of the world's export market, shipping to over 90 countries.

NEW CROPS IN CANADA

Field trials of alternative crops in Manitoba that involved farmers and beekeepers have shown promising results for buckwheat, coriander and hemp.

Rheal Lafreniere of the Manitoba Department of Agriculture said the trials were held to measure the level of pollination activity contributed by honey bees under normal agriculture conditions.

"In all cases, the trials were run as producer co-operative trials in which the growers and beekeepers assisted in the initial set-up and data collection of the trials," Lafreniere said in a report to Manitoba beekeepers.

"Other than following certain protocols necessary for the experimental design, the producers managed their operations the same as they would under normal conditions."

Buckwheat has been grown on the prairies for many years but has never been widely accepted because of a reputation as being an unreliable seed producer.

Lafreniere said in many cases this has been attributed to poor pollination. The main complaint was that bees were placed near buckwheat field too late in the year for optimal seed production.

"Typically the bees are only moved onto buckwheat field after crops like canola have finished blooming," he said.

Last year's buckwheat trial looked at the effects of timing of pollination as well as the effect of competition for pollinators by other crops in the area.

Pollen foraging behavior was monitored using four pollen traps at each of two sites:

- A high competition site bordered by two fields of canola;
- A low competition site with no other agriculturally grown honey producing crop in the immediate area.

The traps indicated that initially bee activity and pollen collecting was extremely low in the buckwheat fields when alternative sources were available.

But over a period of time, competing crops finished blooming, and buckwheat pollen foraging began to increase.

"This increase was never as dramatic in the high competition sites as it was the low competition site." Lafreniere said. "In fact, buckwheat pollen in the high competition site never became the dominant pollen source – less than 20 percent – whereas buckwheat pollen in the low competition site soon became the dominant pollen source and at its highest percentage it represented 80 percent of the pollen collected during that collection week."

Lafreniere said that although some of the difference between high and low competition sites could be attributed to varietal differences in buckwheat cultivars, it would still appear that competition is an important factor in dictating whether honey bees will forage for pollen on buckwheat.

He said growers should take that into consideration when deciding when and where to plant buckwheat.

Coriander is a relatively new crop on the prairies and the trial was to determine what extent introducing honey bee colonies at a rate of one colony an acre would influence seed production when adjacent to a field of canola.

Using bee-proof cages to exclude pollinators, yields between open pollinated plants inside and outside the cages was compared in the presence and absence of honey bee pollinators.

The trial found that honey bees have a significant influence on seed production even when a highly competitive crop such as canola is nearby.

"Placing honey bee colonies on coriander can increase seed yields by up to 50 percent," Lafreniere said.

No formal trial was held on hemp, which is considered is a possible future crop for the prairies.

Currently, hemp can only be grown under a special research permit and none of the production can be used for resale.

The results of a non-scientific pollinator collecting expedition found honey bees were the dominant pollinator though there did not appear to be any colonies within the immediate area.

"This would indicate that hemp appears to be highly attractive to honey bees, although at this time, it is still not known whether the presence of honey bees will significantly influence seed production in hemp," Lafreniere said.

HARRY LAIDLAW HONORED

Harry H. Laidlaw, Jr. Of Davis, California received the College of Agricultural and Environmental Sciences' Award of Distinction on Friday, October 17, 1997, during the ninth annual College Celebration at the University of California, Davis.

The College presents this award, its highest honor, for contributions and achievements that have enhanced the ability of the College to serve the agricultural and environmental communities as well as the public.

Laidlaw, professor emeritus in UC Davis' Department of Entomology, is known throughout the world today as "the father of bee genetics and breeding." He discovered new techniques that resulted in the development of a successful method for the artificial insemination of queen bees. His first book was published in 1932, and his most recent book, "Queen Rearing and Bee Breeding," is currently in press. Laidlaw's over 90 publications span more than seven decades.

SUGAR STILL GETS BENEFITS

The U.S. Department of Agriculture's Commodity Credit Corporation (CCC) announced (September 25) that nonrecourse loans will be available in FY 1998 for sugar eligible to be pledged as collateral for CCC loans. The national (weighted average) loan rates for 1997-crop raw cane sugar will be 18¢ per pound and for refined beet sugar 22.90¢ per pound. The Federal Agriculture Improvement and Reform Act of 1996 requires CCC to offer nonrecourse loans to sugar beet and sugar cane processors if the sugar tariff-rate quota is established at a level above 1.5 million short tons. The Secretary established the sugar tariff-rate quota at 2,011,718 short tons, raw value Sept. 16, 1997.

NH B.O.Y.

Pictured here is Joe Orr (right), a long-standing member of the NH Beekeepers Association, receiving the NH Beekeeper of the Year Award from Mike Bayko, Secretary for the NH Beekeepers Association.

The award read as follows – "The Francis Dodge Award in recognition of your interest, dedication and the sharing of knowledge with others about honeybees and the art of beekeeping." Mike commented particularly on Joe's work with children. He is a very wonderful man, and those of us who know him would like to see him get the recognition of having this included in your publication.

SEND US YOUR MEETING NOTICES 2 MONTHS IN ADVANCE & WE WILL PUBLISH THEM FOR YOU

NEW PESTICIDE OFFICE

Deputy Agriculture Secretary Richard Rominger announced (September 8) the creation of the Office of Pest Management that will serve as USDA's focal point for pesticide regulatory issues. This is part of a new, coordinated approach to minor use pesticides issues that builds on existing programs at USDA and the U.S. Environmental Protection Agency (EPA). The new office is charged with integrating and coordinating pesticide issues within USDA along with improving communications with and strengthening the existing network of grower organizations and crop specialists at land grant institutions. This will help make available accurate, high quality data on pesticide use practices for regulatory decision making.

Tax Exemption Benefit

CONSERVE, DON'T DEVELOP

August 5, Pres. Clinton signed into law a modified version of The American Farm & Ranch Protection Act, which provided an exclusion from federal estate tax for land subject to a permanent conservation easement. Section 408 of the Taxpayer Relief Act offers tax incentives those who retire land into conservation easements rather than try to develop it. The provision was inserted in the reconciliation bill by Sen. John Chafee, RI and allows a 40% estate tax exemption for land committed to conservation. The measure applies only to land within 25 miles of a federally designated metropolitan statistical area, national park or wilderness area, or within 10 miles of an urban forest, and sets a $500,000 cap on tax benefits. The act is the federal government's first tax incentive for voluntary land conservation in 20 years.

MO B.O.Y.

Ken Corbin was selected Missouri Beekeeper of the Year. Eastern Missouri Beekeepers Association is a beekeeping club of about 70 members from the St. Louis, MO area. Ken has been Secretary of the club for eight years and he has been a beekeeper since 1981.

Display Index

1902 started off with an interesting discussion between C.C. Miller and E.R. Root on the best way to produce the stock you wanted would be to control the drones the queen mated with. In fact, a single-drone mating would be perfect. How to accomplish this, however, was left to speculation.

Tongue length, and tongue 'use' were questioned. For instance a tongue 0.24" long was impressive, but the bee was only able to use 0.16" of it. So why pay more? C.P. Dadant early in the year made a good point in defense of how comb honey was produced. You'll remember that much had been written about how comb honey wasn't really honey, but rather simply sugar syrup put in cleverly-made wax containers by machine? Well, C.P. blasted that theory when he said that if that were true, wouldn't they all look alike? He defied anyone to find two identical sections, let alone hundreds or thousands. E.R. then reinforced that challenge with his offer of $1,000.00 to anyone who could prove comb honey was manmade. So there!

Early in the year A.I. brought in a ferret to clean up the rats that were rampant around the factory. Cats just couldn't keep up, (and the employees kept getting rid of the cats!), so something else was needed. The ferret came in, got rid of the rats (killed some, scared away the rest) and A.I. was very pleased. Oh yes, he had a book of raising ferrets for only 12¢ if you were interested.

Frank Benton was appointed 'Apicultural Investigator' for the Department of Agriculture the first official position for beekeeping. And in March comb honey was selling for 14¢ fancy, 13¢ No. 1, 12¢ No. 2, and wax at 29¢. Rambler's trip to Cuba turned up some interesting figures. In 1901 Cuba exported 4.8 million pounds of honey and 1.1 million pounds of wax. Early Spring found the Root Company 20 cars behind in orders, even with the factory running 11 hours/day. And A.I. was pleased the phone company was going to start giving the time. Good for business, he said.

C.C. Miller made a timeless statement that Spring, "A beginner with a few brains, boards and a saw, is the man before all others who feels called upon to invent a beehive." How true. And by May, Root had sold 85 car loads of equipment and were still 15 behind. They had 750 colonies and were selling queens for – untested - $1, tested $2, selected untested - $1.25, select tested - $2.50, breeding - $5, select breeders - $7.00, extra select breeders a year old - $7.50. Plus, a one frame nuc without queen - $2, two frame without queen - $3, three frame without queen - $3.50 and eight-frame without queen - $7.50.

A.I. spent most of that Summer at his Michigan cabin near Traverse City, raising potatoes and a few bees. He also discussed the advantages of having a barometer for predicting the weather (and we sell one), and placed an ad for experienced machinists to run the $2,000 worth of new equipment just installed.

W.H. Pridgin published several articles on queen rearing, including how to make wax cell cups by dipping shaped dowels and how to make a transfer tool. He was on top of things.

On July 15 that year, C.P. Dadant died. He was hailed as one of the most influential beekeepers on two continents. He was 85.

Several articles on the refinement of the 'brushed swarm' technique of management were published that Summer. E.R. coined, or at least made standard, the term 'shook swarm' method. The term still stands.

Later in the year A.B. Mason, the Secretary of the National Beekeeping Association died of burns received in a natural gas explosion at his home. He wrote the Constitution for the group. And, C.C. Miller's book '40 Years Among The Bees' was released. Don't you wish you had a copy of that today?

The A.I. Root Company was a growing honey packer and a long article on how they did that was published. They needed to wash bottles, and put in a measure of lead shot to clean out the glass shards first. Honey was bottled only warm, but heated to 160° once in the bottle. A cork was pounded in and sealed with wax. They produced a 'duplicable' blend, perhaps the first McHoney? A.I.'s mother passed away that Fall, and he wrote three pages on mothers. She was 90. His father died 21 years previous.

That Winter the Root Company sent 500 of their 1,000 colonies to Cuba. They had screens on both top and bottom in eight-frame Danzenbaker hives. They wanted year-round queen production. We'll see if it works.

At the end of the year A.I. chided his children, who had paid an instructor to lead them in 'physical culture,' calisthenics by another name. Rather, said A.I., go dig potatoes.

Gleanings In Bee Culture, 1902

BOTTOM BOARD