ALL ABOUT COMB BUILDING

APR 1997

BeeCulture

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

WHO'S WHO IN APICULTURE 1997

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

APRIL 1997 VOLUME 125 NUMBER 4

FEATURES

125 YEARS OF GLEANINGS **18**
1885-1890

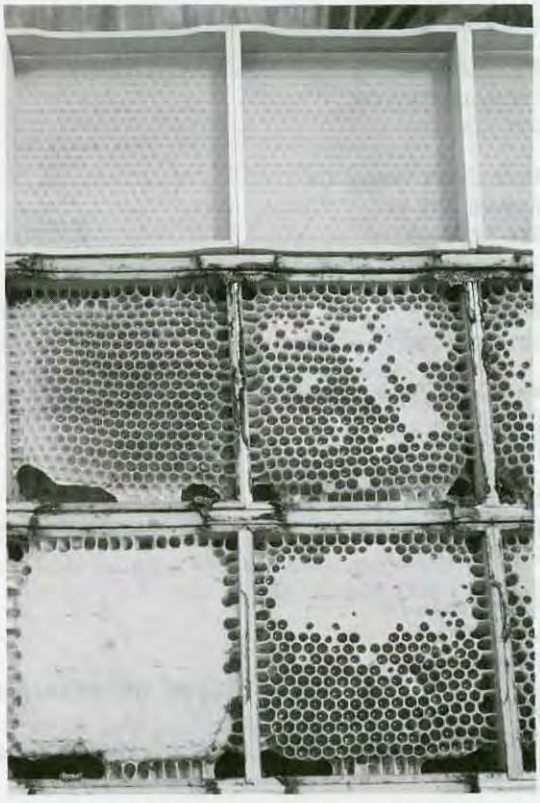
MANAGING FOR COMB CONSTRUCTION **24**
Managing your bees for optimal comb construction pays off for comb honey producers.
by Stephen Pratt

PACIFIC NORTHWEST POLLINATION REVIEW **28**
The results of last year's survey, plus a growing accumulation of data show a promising pollination picture in the Pacific Northwest, and provides information for pollinators everywhere.
by Michael Burgett

THIS SEASON, CONDUCT A BEEKEEPING WORKSHOP **32**
Any group can organize and run a beekeeping workshop this season. Just adhere to a few simple rules for success, and satisfied customers.
by James E. Tew

EFFICIENCIES **36**
If you're considering expanding, attend to the details. Profit, or frustration lie in those details.
by Richard Bonney

A SAGE IS A SAGE IS A . . . **39**
The true sages, and those only called sages range from garden annuals to rare wildflowers to common plants on hillsides.
by B.A. Stringer



COVER
Comb honey production requires some specific skills, and bee behavior. Rapid wax production and comb building are necessary, and can be enhanced by the producer.
Top photo by Stephen Pratt, Cover by Kim Flottum

BAIT SECTIONS **41**
Controversy still surrounds the use of bait sections when producing comb honey. Whether wooden sections, round sections, or even the square plastic sections. Here's some answers.
by Roger Morse

(ALMOST) NO PAIN QUEEN REARING AND COMB HONEY PRODUCTION **44**
If you make comb honey, you need strong, young, productive queens. Here's a way to get both.
by Carl Egolf

1997 WHO'S WHO

DEPARTMENTS

THE INNER COVER 6
1996 Honey Statistics; and New Beekeepers.
by Kim Flottum

MAILBOX 9
Buddhism & Beekeeping; Simple Frame Jig; Snake Oil Response.

APRIL HONEY REPORT 12
(Field Reporters)

NEW PRODUCT REVIEWS 14
Books, Videos & Equipment.

QUESTIONS & ANSWERS 52
Honey Plants, Used Comb, Requeening.
by Richard Taylor

GLEANINGS 53
Honey Board News; Plant Trees This Year; EAS Apitherapy.

CLASSIFIED ADS 56
Bargain Pages

BOTTOM BOARD BIOGRAPHY 72
William W. Cary – Important to beekeeping, and to L.L. Langstroth.
by L.L. Langstroth

COLUMNS

RESEARCH REVIEW 15
The findings from a European Conference shed light on several aspects that affect honey bee behavior here in the U.S.
by Roger Morse

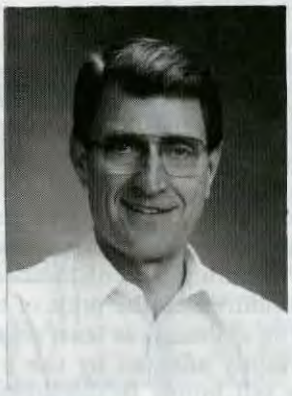
DO YOU KNOW? 17
How much do you know about pollination?
by Clarence Collison

LA MAISON DU MIEL 21
The French are far more refined, when it comes to selling honey, than we are.
by Mark Winston

HOME HARMONY 46
Comb Honey Kitchen Treats!
by Ann Harman

BEE TALK 50
The efficiency of the honey bee in assessing nectar sources, or new homes, and then recruiting followers is amazing, but measurable.
by Richard Taylor

William Cary, Pg. 72



JOHN ROOT
Publisher

KIM FLOTTUM
Editor

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INNER COVER

The annual USDA Honey Report came in late February. Compiled by the Agricultural Statistics Service, its validity has always been a bit murky, but it seems to be better than anything else available. They count only those beekeepers who have five or more colonies, so some get left out. Nevertheless, their numbers are consistent – right or wrong or close.

Those numbers are interesting though, especially if you look at the top 10 producing states.

State	1995 No. Colonies x1000	Total Production x1000	1996 No. Colonies x1000	Total Production x1000
1. CA	420	39,060	390	27,300
2. SD	240	20,400	240	23,280
3. FL	230	19,780	240	25,200
4. ND	220	23,760	230	19,780
5. MN	165	13,530	150	11,550
6. ID	125	6,000	110	4,950
7. MT	106	8,480	117	7,020
8. MI	97	8,924	90	8,640
9. TX	84	8,904	82	6,806
10. WI	73	5,767	69	5,382
Total Top 10	1,760	154,605	1,718	139,908
Total U.S.	2,648	210,516	2,566	198,095
Percent of Total	66.5%	73.4%	67%	70.6%

USDA NASS

Since these 10 states have two-thirds of the colonies, and produce *nearly* three-quarters of the U.S. honey (according to USDA figures) what affects them affects everybody else.

Interesting differences develop when comparing the top 10 states and the U.S. as a whole.

	Percent Change, 1995 to 1996	
	No. Colonies	Honey Produced
U.S.	-3.1%	-5.9%
Top 10	-2.4%	-9.5%

The U.S. dropped 3.1% of its colonies, and nearly 6.0% of its production from '95 to '96, while the top 10 dropped 2.4% of their colonies, but nearly 10% of their production. One explanation lies in production/colony. In 1995 the top 10 averaged 87.8 lbs./colony, while the U.S. as a whole went only 79.5 lbs. In 1996, the top 10 averaged 81.4 (a 7.3% drop), while the U.S. averaged 77.2 lbs. (a 2.9% drop).

In perspective, (see 10 year chart), colony *production* bounces all over the place, and, though important today, tends to lose significance over time. You can't do much about Mother Nature.

None of this, I know, has addressed the price of honey, which has an effect on the number of colonies, at least to some degree. The increase in '89 was certainly affected by the price support program changes. It paid to sell honey to the government. But after the program declined, and the price declined with it, the number of colonies followed suit. Production stayed fairly stable, however, during those years, Mother Nature notwithstanding. With the price increase, the next couple of years *should* see a rise in colonies. Economics 101? Maybe.

Year	# Col. x 1000	Prod. Lbs. x 1000	Avg./Col. lbs.
86	2770	217168	78.4
87	3190	226782	71.1
88	3186	211511	66.4
89	3443	176957	51.4
90	3188	196035	61.5
91	3181	219171	68.9
92	3030	220584	72.8
93	2876	230368	80.1
94	2770	217168	78.4
95	2648	210516	79.5
96	2566	198095	77.2

USDA NASS

You can get the '94, '95 and '96 data for every state on the web, if you're inclined, at www.usda.gov/nass. It makes good reading.

•

I am encouraged by the reports, from nearly everywhere, of the numbers of people attending beginning beekeeping classes, showing up for the first time at local meetings, buying new equipment and expressing an interest in this industry.

From my observations, and those of others who have noticed, a good number of these people come with a gardening background. It seems that the immense fanfare given by the press to the great shortage of feral, and even domestic honey bees, coupled with the noted, or at least perceived absence of bees in their respective gardens has finally spurred them to action. Good.

But this new, and certainly welcome group of people come with their

Continued on Page 48

1996 Honey Statistics; and New Beekeepers

Reader Assistance

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MAILBOX

Buddhism & Beekeeping

In response to the article, *Buddhism and Honey Bees* by Michael Burgett and Pornthawee Riddhiputra in your January issue.

First, thank you for presenting a perspective on beekeeping which represents a significant proportion of the world's beekeeping community. It seems that the majority of English-speaking countries tend to focus primarily on European and occasionally Middle-eastern traditions regarding beekeeping history. With regard to religious references in particular, Christendom seems to hold a predominant place in English beekeeping literature. It is refreshing, therefore, to see an expansion on the usual patterns of thinking regarding beekeeping history.

In reading through the article, it was noted that there were some chronological errors regarding the life of the Buddha according to most traditions of Buddhism. Gautama (the original) Buddha lived from approximately 600 to 535 B.C. (not A.D. as the article stated). Accounts may vary somewhat according to various traditions.

Buddhism is a diverse religion with many forms and traditions that have evolved over the past 2,500 years, and reflect its spread throughout most of Asia.

As suggested in the article, there are several basic tenets of Buddhism, which most schools adhere to, and which may be in contrast to what other religious traditions espouse in their approach to beekeeping. The notion of reverence for life in Buddhism applies to all things, including the bees themselves. Therefore, methods of beekeeping that willfully or deliberately result in killing the bees would not be advocated or practiced, if at all possible. An exception might be in requeening, grafting larvae, or inspecting samples for diseases, if it is for the "greater good of the colony." This is the rationale that I tell myself anyway, though it feels sad, nonetheless. Buddhist tradition does not ascribe supremacy to humans over other life forms. Being human in this sense, therefore, implies responsibility to use our unique intelligence and skills to facilitate the lives of other beings, as well as our own.

As an example, any beekeeper who has worked bees roughly or insensitively, knows that karma, or the law of cause-effect, will produce an equally "insensitive" reaction from the bees. The best course of action is, therefore, to work the bees with sensitivity and a care, or at least an awareness of their needs and situation.

I would like to say thanks to the authors of the aforementioned article, as well as the publishers and editors of *Bee Culture*. I have been fortunate over the past several decades to know, work with, and learn from some of the foremost honey bee scientists and practical beekeepers. But it seems rare in the West that beekeepers are provided with viable forum for expressing alternative views and philosophies from mainstream Western belief systems.

Allen Summers
Niwot, CO

•

In regards to your article of *Buddhism & Honey Bees,* there is one big mistake. Buddhism is not older than Christianity. Christianity began 33 AD some 450 years before the idol worship of Buddha.

Donald Young
Converse, IN

Editor's Note: *We're looking for the correct dates for both.*

Swarm Question?

The bees in Guam taught me a lesson about swarming this season. I spend November through February here and tend the University of Guam's two hives then. The rest of the year they are untended.

The previous two seasons – I've only been involved that long – they have both swarmed. Last Winter I added a second deep of foundation below a queen excluder and a medium of foundation above. This Winter I found that one had swarmed and one had not.

The one which did not swarm had drawn out both sets of foundation and had stored a significant amount of capped honey in both boxes so drawn. The other had drawn no foundation in either box and had chewed up much of it. This hive, located several miles from the first, has never stored a great deal of honey and none the previous year.

Is this just an isolated case or does it mean a reasonable nectar flow will encourage more active behavior which, in turn, provides more room in the brood chamber?

Dan Hendricks
Mercer Island, WA

Alternate *Varroa* Hosts?

It has been said in *Bee Culture* and other periodicals that it is safe to re-introduce bees into equipment in which colonies have died from *Varroa* mite. I have kept bees in this area for 70 years, commercially for over 40. I find *Varroa* is a greater scourge than foulbrood ever was. Though Apistan helps it is not the answer. New colonies are quickly reinfested. Opinions to the contrary, there must be an alternate host. Bumble bees, wasps and hornets, were once here in great numbers. Their decline parallels *Varroa* infestation in this area.

Walter Kappel
Friendship, WI

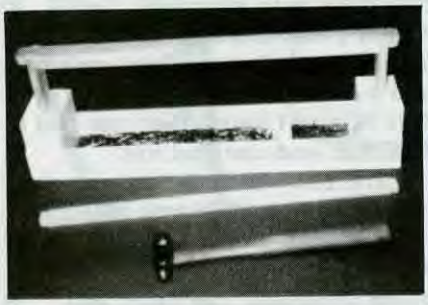
Continued on Next Page

MAILBOX

Simple Frame Jig

Here is a picture of my frame "top bar" nailing jig. The frames always come out square, and it is a convenient tray for the two nail sizes. It accommodates all frame sizes, deep, medium and shallow. It is simple to make. Send a SASE to the address below to get a set of construction plans.

James A. Morgan
5012 Perrine Dr.
Jacksonville, FL 32210



Snake Oil Response

I am writing this letter concerning the December and February articles by Mark Winston. Many people are having good results with the product Mite Solution. I received some advertising from Draper's Super Bee Inc. of Millerton, PA. They say they have had good results on the 1000 plus hives they run. I would say that although their test is not scientific, it tells me that this "snake oil" as Dr. Winston calls it is worth further investigation.

Mite Solution doesn't fall under the pesticide law because it is not a poison, it's all natural. After reading the December article, I was to say the least gun shy of using anything but Apistan. In the February issue a case was made for alternating treatments with something other than Apistan. Some of these alternatives seem like a better choice than formic acid. I wish rather than condemning alternatives, we could hear from some people who have used the products. Like it or not if Apistan becomes ineffective, we have nothing. Then people will try whatever they can to keep their bees alive. Hive inspections at $5.00 a hive would be a last resort.

Mark Young
Ludington, MI

Editor's Note: *The writer has a point when considering alternatives. But is dead wrong on the point of ". . . not a poison, all natural." Don't for a moment believe that "All Natural" products can't be poisonous. Consider Nicotine, a deadly poison; digitalis, another; spearmint oil can be lethal . . . the list goes on. Used in the proper amount, all these are safe. Abused, and they can be deadly.*

Single Source Honeys Wanted

We are currently in the process of preparing a book on mead and mead making for publication. We are seeking to provide mead makers comprehensive, descriptive information about the flavors, aromas, variety and dynamic range of "single source" honeys available. To that end, we are seeking the cooperation of your readers in compiling a list of honey producers and packers who sell unique honey in one to five gallon quantities by mail order.

We are more than willing to pay a fair price for the honey and for shipping. We are particularly interested in varieties that may not be widely distributed, but if you think your honey is unique and tasty, by all means, please get in touch.

Because of the nature of our subject matter, and because of our own feelings, the book will be extremely supportive of beekeepers and their efforts. If you are interested in being included in our "Quality Honey Suppliers" appendix, please contact Dan McDonnell at (313) 663-4845 or via Email at danmcc@umich.edu or Ken Schramm at (810) 816-1592 or schramk@wcreasa.k12.mi.us.

Ken Schramm

Honey Prices Wrong?

It appears the January issue Honey Report for Region 10 has some flaws – 12 oz. Sells for $.07 less than 8 oz., 2 lb. sells for $.50 more than 1 lb., 5 lbs. sells for $.21 less than 4 lbs.

I read this article first each issue. I sell 8 oz. Bears for $1.25, 2 lb. for $4.00, 4 lb. for $7.00 and 5 lbs. for $8.50.

Earl Markworth

Editor's Note: *The best, and worst part of our Honey Report is that the numbers you see are 'averages.' Most times they work, sometimes they don't. We urge you to use not only your region's numbers, but neighboring regions, and the over all average and, especially, the range of prices for any one commodity.*

Melting Honey

I made my warming oven in an old refrigerator, using a furnace high end limit switch ($23.30) or get one used from an HVAC contractor. A used computer cooling fan (to prevent the warm air from staying on top) and a 100 watt bulb finishes the job.

Drill a 1" hole in the side approximately 2/3 from the bottom for the limit switch. Mount limit switch. Wire it to a cord. Wire the interior light and fan in parallel. Adjust the unit to approximately 140°F. It should take two or three days to liquefy granulated honey.

Michael Ribley
Denver, CO

ABF Resolution

I understand that during the 1997 ABF Convention in Norfolk, VA a resolution was adopted by the ABF executive board asking North Carolina to repeal their law imposing fees on queen and package producers selling in NC.

This is not an "import fee" as was erroneously stated! In fact, all NC queen and package producers are required to pay the $25 fee as

MAILBOX

producers from other states. NC collected $600 in fees for 1996. The total is rather small when compared to the total cost of our program of protecting NC from the Africanized honey bee.

I regret the protection of NC and NC beekeepers by our NCDA/NCSU will be an inconvenience and minor cost to others. I am sure you will understand our position and continue to cooperate with us in the protection of our beekeeping industry, beekeepers and citizens.

Fred G. Deer
Cary, NC Member of NCSBA & ABF

Humbugs & Swindles Dept.

About 125 years ago, A.I. Root started a regular department headed as above. When an equipment supplier, patent seller or bee supplier developed a wide-spread reputation of selling inferior material, items different than advertised, or patent rights he had no right to sell, A.I. let it be known to any and all there was a problem in this department. The following letters are self-explanatory, and, after exhaustive, but futile efforts from this office to right these wrongs, we present the following ...

•

In your February issue there is a letter from Lloyd Kreklan. I had the exact problem with Blue Ridge Apiaries. In fact I could have written the letter.

I waited at least five years (after many letters and calls) and found his ad again in your magazine about two or three years ago. This is how I handled it. The name of the company had changed but the address hadn't so I called his 800 number. I continued to call his 800 number every day until he finally decided to send my bees. It took about five years from the time I ordered until I got them.

At least I got the satisfaction of him having to pay for all the 800 calls.

Harold L. Reuer
Moose Lake, MN

•

I had the same experience as Mr. Kreklan (Feb. 1997) with Blue Ridge Apiaries. After their failure to deliver my 3# packages in 1995, they agreed to include an extra queen with the package in 1996. Now, after failure to deliver in 1996, the reissued invoice says that a mated queen is N/A.

$38 is a lot of money to lose, for me.

Sally Mills
Coburn, PA

•

It sure was good to read the article about problems Lloyd Kreklan had with Blue Ridge Apiaries.

He got me for the price of three packages plus shipping ($114.00) and he took my order with a VISA card. Like I say, it sure was good to see someone go to bat for us who got robbed. He is the only one I ever had a problem with.

Keep up the good work. Love your magazine and all of the articles in it. Can hardly wait for it each month.

Herbert Sigmon
Claremont, NC

•

I can relate to Lloyd Kreklan's package problems.

I had ordered three packages in 1991 from Blue Ridge Apiaries. They were never shipped, he also stated all the so called problems that he was having, and would send them next Spring. Well knowing that he had done it once he would probably do it again, so I asked for my money back. It took about one year, but I got it.

Why not have a section every month devoted to the humbugs and swindles?

Harold Cary
Mason City, IA

•

I read Lloyd Kreklan's package bee problems with Blue Ridge Apiaries. I had the same trouble.

He wouldn't refund my money only told me all his problems. I went after him and I turned it over the Consumer Affairs, Columbia SC and VISA card. He finally sent me a check. I think by charging to my VISA account they helped me get a refund.

Joseph Sparrow
Waukesha, WI

•

After reading the letter in the Feb. *Bee Culture* I am writing to tell you that I had the same problem with Blue Ridge Apiaries.

This is the first time that it has happened to me.

Howard Thoma
Pomeroy, OH

•

In February 1995 I ordered packages worth $324 from Blue Ridge. So far, I have not gotten any bees or money refunded. Several phone calls have produced promises with no results.

W.W. Watson
Richton, MS

•

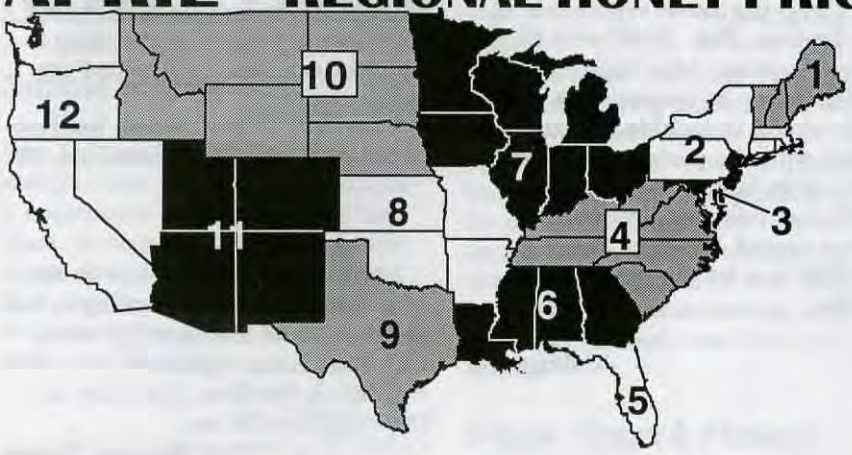
I am a hobby beekeeper who never had any problems with my bees. I heard about the mites from your magazine, but thought they would never get to me and low and behold the winter of 1995-96 I got hit and lost all my bees.

I ordered two 3-lb. packages of mite resistant bees with queen in January 1995 from Blue Ridge Apiaries. They were paid for in advance and like Mr. Kreklan I too have gotten the same treatment. I sent him a certified letter asking for a refund and never got an answer. To top it off this past December I received another letter asking me to order more bees.

To this date I have received nothing from him. I hope *Bee Culture* never lets Blue Ridge advertise in the magazine again.

Karl J. Pecha
Nesquehoning, PA

APRIL – REGIONAL HONEY PRICE REPORT



Region 1

Prices still climbing, but slowly at retail and wholesale, generally stable. Sales stable also. Average 9.2 fronts and 3.4 brands in stores, most without slotting fees.

Region 2

Prices stable to increasing a little, along with sales. 15.8 fronts average in stores, supporting an average of 4 brands. Number of fronts remained steady in the last year, but slotting is present in about half the stores surveyed.

Region 3

Prices steady to rising still, but only modestly. Average 15 fronts/store, with 4.2 brands. Number of fronts decreasing just a little as stores with slotting fees increasing a bit.

Region 4

Prices steady to decreasing a bit, sales steady. Average number of fronts high at 14.5, supporting average of 4.5 brands. Fronts have stayed steady for past year. Slotting present, but not dominant.

Region 5

Prices increasing more than most, probably due to both new (and short) crop, and tourist traffic. Fronts average 11.5, with 6 brands on average. That has increased in the last year.

Region 6

Prices steady to decreasing just a bit, but not much. 11.3 average fronts/stores, supporting 4 brands, on average. Sales steady, with number of fronts steady. Slotting in many areas here, but primarily the biggest chains.

Region 7

Prices increasing at a fairly steady pace, both retail and wholesale, but store owners saying only steady at retail. Average numbers fronts is 12.5, with 3.1 brands. Sales steady, fronts steady, slotting in about half of the stores.

Region 8

Prices steady, sales steady and demand steady. 11 fronts average, supporting 4.3 brands on average. Slotting not dominant, but is in larger chains.

Region 9

Prices steady to increasing ever so slowly. Sales steady. 12 fronts average/store, with 4 brands average.

Region 10

Prices steady, sales steady and demand steady, but promises to increase soon. Average 11.5 fronts/store, with 6.3 brands. Slotting in about half, and steady.

Region 11

Prices fairly steady both wholesale and retail. Sales and demand steady, also. 12.8 fronts on average, supporting an average of 8.3 brands. Number of fronts steady for the past year, but slotting fees in about half the stores surveyed.

Region 12

Sales about steady, but prices increasing steadily. Demand not moving much, which is not good. Except in wholesale and industrial, where it's confusing. 14.7 fronts, on average, support 3.8 brands on average in stores surveyed. The number of fronts is steady to increasing a bit. Slotting strong in this region.

	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	68.79	71.71	74.83	68.33	74.83	66.00	72.20	81.00	54.00	74.83	79.00	64.60	55.00-99.00	70.48	68.23	47.98
60# Amber	64.92	67.19	70.36	63.25	70.36	61.50	71.71	65.67	51.00	70.36	68.75	65.00	50.00-95.00	66.08	65.61	45.61
55 gal. Light	0.97	1.04	1.03	1.13	1.03	0.98	0.98	1.00	1.05	1.03	0.99	0.95	0.85-1.25	1.00	0.97	0.67
55 gal. Amber	0.90	0.98	0.91	0.94	0.91	0.88	0.94	0.94	1.00	0.91	0.89	0.92	0.70-1.10	0.93	0.91	0.62
Wholesale - Case Lots																
1/2# 24's	30.27	28.23	33.13	30.56	33.13	34.53	29.24	33.13	35.00	33.13	35.17	30.40	20.40-48.00	31.00	30.22	22.50
1# 24's	43.25	42.21	57.23	39.64	57.23	40.10	41.79	39.36	50.00	57.23	56.58	42.61	32.40-96.00	43.28	41.45	32.57
2# 12's	37.99	38.50	42.68	36.95	42.68	38.35	37.33	39.60	38.00	42.68	46.73	37.50	29.40-60.00	38.64	38.64	30.89
12 oz. Plas. 24's	34.38	36.97	32.76	31.81	32.76	34.00	34.89	32.08	38.50	32.76	43.23	30.27	15.00-48.00	35.29	35.36	29.02
5# 6's	39.75	45.36	44.53	37.95	44.53	36.00	39.16	39.00	45.00	44.53	38.95	35.65	25.50-67.50	40.60	**38.31**	**31.78**
Retail Honey Prices																
1/2#	1.86	1.73	2.83	2.17	2.83	1.63	1.87	1.59	2.96	2.83	2.50	1.89	1.00-3.59	1.88	1.93	1.52
12 oz. Plastic	2.19	2.21	2.29	2.24	2.29	2.16	2.21	2.17	2.99	2.29	2.33	2.06	1.59-3.06	2.23	2.14	1.74
1 lb. Glass	2.67	2.57	2.90	2.65	2.90	2.79	2.45	2.63	3.75	2.90	3.20	2.73	1.99-3.99	2.71	2.64	2.00
2 lb. Glass	4.54	4.61	5.60	4.41	5.60	4.40	4.35	4.26	4.75	5.60	6.18	4.52	2.49-9.75	4.57	4.35	3.43
3 lb. Glass	6.03	7.10	6.40	6.31	6.40	5.88	6.08	5.59	6.25	6.40	6.61	5.97	4.50-8.50	6.19	5.78	4.59
4 lb. Glass	7.21	7.31	7.77	7.03	7.77	7.63	8.08	7.39	7.75	7.77	7.77	6.25	5.50-10.25	7.56	7.55	5.62
5 lb. Glass	9.84	11.12	12.85	9.48	12.85	8.00	8.82	8.99	10.00	12.85	12.22	8.50	6.69-21.99	9.87	9.21	7.08
1# Cream	3.57	3.27	6.20	3.00	6.20	3.09	2.91	2.94	6.00	6.20	3.69	2.89	2.19-12.95	3.45	3.30	2.57
1# Comb	3.98	4.47	4.02	3.85	4.02	4.00	4.02	3.52	6.00	4.02	4.98	3.50	1.95-6.00	4.12	4.16	3.35
Round Plastic	3.70	3.28	4.42	3.13	4.42	4.00	2.95	3.37	4.00	4.42	5.75	4.06	2.50-7.00	3.77	3.76	3.05
Wax (Light)	3.01	3.74	3.44	2.30	3.44	2.58	2.60	4.75	4.00	3.44	2.59	3.13	1.25-5.00	3.07	3.06	1.88
Wax (Dark)	2.47	3.10	2.87	2.06	2.87	2.22	2.05	3.50	3.75	2.87	2.30	2.59	1.10-4.25	2.22	2.66	1.54
Poll. Fee/Col.	36.40	39.63	35.80	35.00	35.80	35.00	39.17	35.00	15.00	35.80	37.50	35.14	15.00-55.00	37.21	37.14	30.25

NEW FOR YOU

Backsaver Lifter

Backsaver is a convenient patent pending device designed to make lifting and moving supers or hive bodies easier, and safer.

Designed by Eric Nickerson to save his back, and to make his beekeeping easier, this handy gadget is now ready for every beekeeper.

It works on simple leverage, and as the photo shows there are few moving parts. Two extendable legs support the weight, are hinged at the top with a heavy duty chain suspended between them. The metal-reinforced clamps snug into handholds and, by simply tilting the device, the super or hive body lifts up, up and away, to be set down gently and safely nearby.

Made of pressure treated wood, stainless and galvanized steel, it folds up for easy transport. It only weighs 13 lbs. For the beekeeper who has trouble lifting 90 lb. hive bodies or lifting off that 5th honey super, this tool is ideal.

Obtain from Mountain Road Apiary, 1711 Chateau Ct., Fallston, MD, 21047. Call 410-877-0345. $69.00 plus $6.50 p&h.

New Jars

Starbucks Coffee and Ritz-Carlton Hotel are both realizing the potential of Berlin Packaging's London Rectangle. The unusual shape and unique label area create a gourmet look and attract attention. The crystal-clear glass helps the product look as good as it tastes. The 6.5 fl.-oz. (190ml) and wide mouth make for fast filling on the line and easy spooning at the table. With two finish options – 58/2030 and 58/400 – and many closure choices, the London Rectangle is a perfect fit for any gourmet line. In-stock for immediate shipping. Berlin Pkg., 111 N. Canal, Chicago, IL 60606; 800-423-7546.

Plant Book

Free Landscape Plants! Paper, B&W. 5½" x 8½", 119 pgs. ISBN 096496306. $9.95, McGroarty Family Nursery, 4390 Middle Ridge Rd., Perry, OH 44081.

There are lots of books on the market on how-to propagate plants. Most are expensive, and most are quite detailed, encompassing the science, as well as the art of plant propagation.

This book is neither. But it does make some assumptions. You need a basic gardening background, so you already know the identities of most plants, and you need just a bit of growing skill, and equipment. But not much of either.

If you have Japanese Maples, Weeping Beech, Clematis, or . . . and want to propagate them, this will tell you how.

There aren't lots of diagrams, or photos so you'll need to understand what the author, a successful nurseryman, says, rather than lots of detailed and color photos. But with the right background the information works.

Kim Flottum

Beeswax Book

Beeswax Crafts. Paper, full color. 8½" x 11". 80 pgs. ISBN 0855358169. Search Press. Available from A.I. Root Co. for $19.95 postpaid. Call 800-289-7668, Ext. 3214.

This is, without doubt, the most beautiful book on beeswax crafts I've ever seen. But it has, sandwiched between the many photos, all the information you'll need to make candles (rolled, dipped, hand-molded, and solid and flexible molded); and decorative; models; wax flowers; wax sheets; wax figures; beauty creams, soaps and polishes (including many recipes for each); encaustic art (some of these paintings are incredible!); and finally, how to make beeswax crayons.

Each chapter shows the ingredients and tools needed, plus the steps from start to finish for the fundamental work, plus lots of examples.

If you work with wax – for shows or for sale – this book is a must-have addition to your library.

Kim Flottum

New Comb Honey Video

"Honey In The Comb" is a delightfully different style of video which every avid beekeeper should enjoy. It is not a bells and whistles major production but rather a down to earth conversation between a father and his son in the beeyard. However, all aspects of comb honey production are covered such as preparing the colony, requeening, supering, removing the crop and preparing the honey for market. It was shot at a quaint little beeyard near Paris, Illinois. The video focuses on the art of Comb Honey production by Gene Killion who is showing the art to his son Mark. Watch as Gene illustrates all of the subtle nuances for producing quality comb honey to his son. You'll learn the secrets that made the Killion name synonymous with quality comb honey. Eaves-drop on the father-son chat in the serenity of the beeyard as you, too, learn the art of producing Honey in the Comb.

Available on VHS for $45 post paid.

Inquiries: "Honey In The Comb", P.O. Box 96, Paris, IL 61944-0096.

Roger Morse

Research Review

"Drifting drones, hygenic behavior, and drone brood attractiveness were featured at this European conference."

Several months ago, about 100 European bee researchers got together in Germany and presented 58 papers and posters. It is interesting to review what is uppermost in their minds versus what we are thinking about in this country. Unfortunately, there were more papers dealing with bee diseases than there were investigating honey bee behavior or any other bee subject, but I think that is true here, too. I've reviewed below what I think are some of the more interesting papers.

Up until about 18 years ago, beekeepers in Iran imported large numbers of queens from the United States. This has not been possible since 1979 because of the political climate in that country. A recent survey sought to determine the survival of these bees. The interesting truth is that these imports and any offspring they produced did not survive or have any long-range effect on the local honey bee population. The authors make clear that selection within a local population can be a useful alternative to importing stock into an area where there is a native race of honey bees. I find this a useful observation. Races evolve and exist in an area because they become adapted to it. Too many times we tend to think that bringing new bees into an area is an easy answer to a problem, whereas selection among existing bees for desirable traits would be more reasonable and rewarding.

The fact that drones drift easily from one colony to the next has been known for some time. However, one of the papers presented gives us some data. Honey bee colonies were placed in groups of five, about eight to 20 yards apart. Half of the drones analyzed had drifted into a colony other than their own. About 75 percent of these drifted into another colony within the group, but 25 percent drifted into a colony in another group. Drones are often not loyal to their mother colony. These data offer a simple explanation about how diseases may be spread from one colony to another by drifting drones.

I found especially fascinating a paper on the efficiency shown by water-collecting bees. Bees were taken into a desert where the nearest water was a little over a mile away. What was observed was that on their way out from the hive, the water foragers carried only a little more than enough honey in their crops so as to reach the water source. By doing this, they could suck up a water load that was about half of their body weight. The water foragers had in their midguts and blood just enough sugar so as to be able to return to the hive without using any of the remaining sugar or water in the crop. In this way they returned to the hive with a full water load. However, if the foragers are delayed for some reason they can take some of the diluted food (about two percent sugar) into their midguts and thus gain the energy necessary to return home. This, of course, makes them much less efficient as water carriers.

There is more drifting of worker bees in an apiary when the hives are close together and look much alike colorwise. One paper asks how drifting affects the length of the life of a worker. The answer is that the length of the lives of worker bees that drift is the same as that of those that do not drift.

Some bees are observed to rest more than others at night in much the same way as mammals rest. Who are the resting bees? One group, pollen foragers, was examined. It was found that the more intense pollen foragers rested longer.

Several papers were concerned with the hygienic behavior of honey bees, that is, their ability to remove dead brood, whatever the cause of death. Two papers report good results from selected colonies confirming that some strains and races of honey bees are more resistant to diseases than are others because of hygienic behavior and good housekeeping. The chief concern is to find bees that will remove brood killed by *Varroa* at the same time. It was found that the defense consists of self-grooming, nestmate grooming, and biting, chewing, and thereby killing the mites. Nestmates even groomed dancing bees and removed mites from them. However, the grooming habits of European bees are still not as strong as those observed on the smaller Indian honey bees, *Apis cerana*, the native host of *Varroa* mites. Hygienic behavior and how it helps to defend bees against disease is receiving attention in Europe as it is in this country, and hopefully out of this will come some resistant bees.

A paper from Brazil again states that no treatment against *Varroa* is necessary in the case of Africanized honey bees in that country. The Africanized bees are naturally resistant to *Varroa*. One factor is that the percentage of infertile mites infesting Africanized brood is nearly three times greater in the Africanized honey bees, though why this is true could not be explained. Grooming among Africanized honey bees is also stronger than that observed in European honey bees.

Continued on Next Page

RESEARCH ... Cont. From Pg. 15

Varroa mites invade drone brood 12 times more often than they do worker brood according to one paper. Researchers in the Netherlands removed worker brood (giving it to another colony) or removed the queen to make a broodless condition and then introduced a comb of drone brood that was near the capping stage. In this way, the researchers were able to trap up to 93 percent of the *Varroa* mites present. The infested drone brood was then removed and destroyed, thus killing the mites. This is presented as an alternative to using chemicals to control *Varroa*. It is obviously a time-consuming method, but at least it offers an alternative. BC

References:

German bee research institutes seminar, 43rd meeting, 1996. Apidologie 27: 261-324. 1996.

? DO YOU KNOW ?

How Much Do You Know About Pollination

Clarence Collison

Spring has sprung and bees will soon begin their valuable pollination activities and beekeepers will be getting their colonies ready for this most important task. With the loss of most feral colonies in the United States, some feel that we are in a "pollination crisis" because we do not have adequate supplies of bees to meet the pollination needs of this country. While some species of wild bees may aid in pollination, the honey bee is still our primary pollinator. How well do you understand the principles and requirements of pollination? Please take a few minutes and answer the following questions to see how well you understand this important topic.

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. ___ In order to achieve effective levels of pollination in most commercial crops, it is important to move the bees in approximately one week before the crop begins to bloom and leave them there throughout the entire blooming period.
2. ___ Foraging honey bees collecting nectar are more effective in achieving pollination than pollen collectors.
3. ___ Both sweet cherries and tart or sour cherries are self-unfruitful, thus require cross-varietal pollination.
4. ___ Honey bee colonies are commonly rented for peach, pear, and plum pollination.
5. ___ Cranberry blossoms are poor producers of nectar and pollen and honey bees do not eagerly work them.
6. ___ Leafcutter bees carry their pollen loads back to the nest on their hind legs.
7. ___ Alkali bees nest in hollow stems.
8. ___ Parthenocarpic fruit are produced without pollination and fertilization.
9. ___ A flower with both pistil and stamens present is called a complete, perfect, or hermaphrodite flower.

Multiple Choice Questions (1 point each)

10. ___ The flower must be tripped in order to achieve pollination and seed set.
    A. Onion
    B. Alfalfa
    C. Carrot
    D. Lettuce
    E. Broccoli
11. ___ The floral structure that must receive compatible pollen grains in order to achieve pollination is called the _____ .
    A. Stigma
    B. Anther
    C. Style
    D. Stamen
    E. Filament
12. ___ Have a strong tendency to cut holes in the bases of flowers that have long slender corolla tubes.
    A. Carpenter Bees
    B. Leafcutter Bees
    C. Honey Bees
    D. Alkali Bees
    E. Bumble Bees
13. Please list four disadvantages for beekeepers who rent bees for pollination. (4 points).
14. The various species of bees are often described as being solitary, gregarious, or social. Please explain how these three groups differ in their reproductive biology. (3 points).
15. Name one abiotic (non-biological) factor that can aid pollination. (1 point)
16. Name three biotic (biological organisms) that are responsible for achieving pollination in various types of plants. (3 points).
17. The female part of the flower is known as the pistil. Upon pollination and fertilization, the ovary becomes a _____ and the ovules develop into _____. (Fill in the blanks, 2 points).

ANSWERS ON PAGE 49

Vol. XVI. APR. 15, 1888. No. 8.

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Gleanings, 1885-1890

The flow of discovery remained unabated for the beekeeping industry during this six year period. Though the most innovative and historic events – moveable frames, national associations, patent hives and the like – were already cataloged, they were constantly debated and refined and discussed.

A.I. Root continued his gradual move towards gardening and other aspects of agriculture, plus began traveling a great deal – to conventions and meetings, to various states in the west and Midwest to investigate not only beekeeping, but all forms of agriculture and church practices. His writings on home interests, the role of religion in daily life and business, and basic how-to gardening expanded, while his influence in beekeeping matters took on a more philosophic and theoretical aspect.

Ernest, A.I.'s eldest son, meanwhile, moved from a college student in nearby Oberlin to, essentially, second in command – of the company and the magazine. He began writing on a regular basis, both under his own name and the Editorial 'we,' replacing and filling in for what A.I. had produced for years. Ernest's education added to the professionalism of the information produced, and the analyses of information sent in by readers. He was also in charge of, or influential in the improvements in the equipment the Company produced. He, along with others in the Company, and his father made several advances during this period, plus several additions to the factory and the machinery that ran it. And, he too, began to travel more, exploring parts of the country that little was known about, in a beekeeping sense, and attending meetings – both with and without A.I. By the end of 1890 he was Junior Editor, and was receiving nearly as much correspondence as the Editor, but primarily in the beekeeping area.

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The subscription price for the magazine, no matter how many pages it went to, remained a $1.00 per year. That was for 24 issues, averaging about 50 pages per issue. Compared to most magazines of the time this was a real bargain.

The early 1885 issues had few changes relative to 1884. The Banner Apiary, Notes & Queries, Humbugs and Swindles, and the Juvenile columns were still present. Plus the Our Homes section. Correspondence was increasing, however, (about 6,500 subscriptions in April), and A.I. suggested the following if you wanted to get something published:

- Don't write till you have something to say, use fewest words possible;
- Use headings, and stick to them;
- Write for the good of man and the Glory of God, not for the money;
- Be brief.

That year Doolittle made the first published report of Winter cluster temperatures – 87°F in the center and 55°F on the edge. The Root Company started making rain coats and selling lawn mowers that year, and A.I. took a trip to mammoth Cave, and had lots of engravings made. He was 46 at the end of the year.

Ernest, meanwhile, was drawing, through the microscope, enlargements of various bee parts – legs, pollen baskets and the like. And he started his own column entitled, "Our Own Apiary." This had to do with Root's bees, equipment tried (and used, or discarded and why), bees imported and the like. Similar to A.I.'s early writings, E.R. would try something, promote its usefulness, then offer it for sale at a very low price.

By year's end, A.I. was writing another column, "What To Do and How To have Fun Doing It, the company had 200 colonies, with some brand new Carniolan stock sent by Benton, A.I. was Ohio State Beekeeper's President, wax was 25¢/lb. and the company had sold 2,347 queens.

The following year, 1886, several notable events occurred. C.C. Miller and G.M. Doolittle began regular contributions, and in response to newspaper claims that beekeepers were adulterating comb honey, A.I. offered $1,000 for proof. (That offer still stands, by the way). The Root Company offered a seed and garden supply catalog, supporting A.I.'s calling to the "New Agriculture,' and in March, he pretty much abdicated control (though certainly not contributions) of the magazine to Ernest.

American Foulbrood was found in the Root apiary, finally, for the first time that year, and in his column E.R. discussed the failures of every published remedy to cure the disease. His solution – shake the bees into a *new* hive, seal them in for two days so they consume *all* honey, and burn the old hive.

Getting bees into, and out of sections discussions began, and according to the April 1997 issue, are still going on.

There was a warehouse fire that year, and one million sections burned. A disgruntled former employee was suspected as a second threat was received. The loss was $10-12,000.

In his Our Homes column, A.I. often discussed the high unemployment, the strikes and the general malaise in the country due to the recession going on. Sales, however, of his supplies weren't down nearly as much as the rest of the country. By May, he was shipping 20,000 sections and 1,000 hives a day.

Late in the year, A.I. offered premiums for new subscribers, was selling vegetables from his garden, had replaced (and offered for sale) his 40 HP steam engine

with a 90 HP model, and credited C.C. Miller, at least in part, with his religious conversion.

A new factory addition came to be in 1887, and several large engravings detailed the inside, along with the outside. They showed stenographers (4); making 10-18,000 smokers/year; the three million impressions/year press; the shipping department, and A.I.'s messy desk (a staple even today).

E.R. was busy, writing about clothing, posture, T-supers for sections, single story hives, chaff hive coverings, foulbrood, honey boards (excluders), grass in a smoker's nozzle to stop sparks, using carbolic acid to drive bees out of a section super(!), and a friend from college studying foulbrood spores.

They were selling 12,000 T-tins (a device to bring sections closer to the brood nest) a month, and had a 20,000 customer mailing list.

The very first Ives process photograph was used in April, of a honey display, and more and more states, and countries were contributing each month.

There were 7,652 subscribers in January, 1888, and the goal was 10,000 as soon as possible. That year, the Root grounds had a carp pond, a large vegetable garden, the apiary of course, a green house, the multi-building factory, warehouses and storage buildings, an ice shed, windmill and crop fields.

Besides President of OSBA, A.I. was elected president of Medina's School Board. He also took writers to task for writing the same letter to several journals. "We need not duplicate our services," he wrote, "since there's so much to do and say." That hasn't changed today. Take note.

The magazine began to have 'themes' each issue, if only loosely so. Swarming, equipment, types of bees and the like. Both Doolittle and Miller were writing on a regular basis, each featured in an issue. They replaced the Banner Apiary column. Hutchinson quit writing regularly and started his own magazine, *The Beekeeper's Review*. It did well, with fits and starts at the beginning, but was short lived.

Topics covered, by a variety of writers included record keeping, importance of drones, book reviews, worker bee gland secretions, drifting and the importance of land marks in the apiary, and producing two ounce sections (what a job!).

E.R. designed a veil to be worn with a hat that tucked under his suspenders. It worked. He started writing the Juvenile department, designed a foundation jig (just like Kelley's, today), and worked on an improved Clark smoker.

Statistics that year, from a *Gleanings* survey, showed about 100 million lbs. of honey and five million pounds of beeswax were produced by 300,000 beekeepers running three million colonies. Major Hruschka, inventor of the extractor died that year, J.T. Calvert visited Dadant's foundation factory – they made 30 tons of foundation that year and comb honey was selling for 16¢/lb.

The one-piece section box trial went to the Supreme Court of the U.S. and Root won, again. Alex Fiddes, the original inventor (but not patenter) was vindicated (as was Root).

And finally, an automatic uncapper and radial extractor were 'improved' by Root, the very first round sections (rings cut from jars) were suggested, and A.I. started wearing spectacles.

In 1889 A.I.'s quest for "a commercial" writer was fulfilled when A.E. Mannun, from Vermont began a column on his outfit. Written in a purely conversational manner it was both different and very informative. And, A.I. took up traveling that year, to California and the beekeepers there. He visited, and reported on the honey plants (sage was big!), and the beekeepers and, of course, the churches and religious attitudes that prevailed (they were different, those Californians). Later, he went to Wisconsin (and visited my old home town). In Milwaukee, he was horrified that people went to a girl's softball game – on a Sunday!

A.J. Cook, from Michigan State wrote routinely on insects sent in, and on honey plants people asked about. He even grew many of those asked about. The die was cast, as far as East Lansing's honey plant role was concerned, I guess.

Doolittle's contributions covered making increases, queen rearing (A.I. didn't like 'grafting'), swarm control, and his 'bee care' for overwintering. C.C. Miller spent the whole year discussing out-apiaries. He covered how to start one, locations, distance apart, how many colonies (75-150 should do), rent, swarms, where the help will stay, rigging wagons (and horses!) to haul bees, ventilation while moving, loading and unloading, record keeping, harvesting and wintering. When he was done, there wasn't anything left to cover.

Alfalfa suddenly became a hot honey plant, especially in the irrigated areas out west. Twenty acres supported 250 colonies, producing 12,000 sections and 4,500 lbs. of extracted honey.

The Ramble, a regular correspondent who traveled to and reported on various beekeeping operations expanded his coverage, and Root hired an artist to illustrate his column.

E.R.'s column covered the 'reintroduced' dove tailed (box joint, actually) hive. After several trials, he settled on having the bee space above the top bars and a 'sunken' bottom board (a bottom with 'sides' added, to give bees space below the frame bottoms). This design allowed the addition of an inner cover, replacing the quilt used so often, and made moving colonies easier, since the top and bottom could be secured, and screen stuffed in the entrance. This was a *major* change in design and philosophy in equipment manufacturing, and it took off like a rocket.

By the end of 1889 *Gleanings* had produced 1,024 pages, gave a 16-page section of photos as a Christmas present to the readers, and shown how to produce the first honey stick (similar to oil paint tubes). A.I.'s new column, "The Special Department for A.I. Root and His Friends Who Love To Garden" was immensely popular, as was Our Homes, and there were 9,200 subscribers.

In 1890 A.I. wired his factory for electricity, so that he could safely have his employees work at night, increasing production capacity. The machinery stayed on steam power, for awhile. C.P. Dadant had been using manual labor to make all that foundation, (85,000 lbs. in 1890) and ignored steam until the Mississippi River was harvested for power, then went directly to electrify.

Much ado about frames in the literature this year – wide top bars, or narrow, thick or thin, and how far apart. Wide and thick worked as an excluder to keep queens

Continued on Next Page

125 YEARS ...Cont. From Pg. 19

out of sections. They also eliminated brace comb between frames. At about the same time, E.R. was modifying the original Hoffman frames to accomplish the excluder asset on top, yet allow bees access around the edges. The same design is still in use today.

Speaking of E.R., he took an extended trip that Summer, by train and bicycle around New England, visiting beekeepers. He even wrote an article on proper bicycle attire. He was, by now, the Editorial writer and was traveling to many of the conventions. He seemed to enjoy the singing part of the meetings. When was the last you heard a song about beekeepers? Let alone, a bunch of beekeepers singing it?

Another edition of *ABC* was released, making 42,000 printed to date. To do this a new press was purchased and the old one went up for sale. And, a new, smaller engine was purchased just to run the press.

Extractors, too, began receiving attention, as more and more beekeepers were selling liquid honey. Steam power was used by the largest, but A.I., in an untypical move, wrote that liquid honey wasn't all that popular. E.R., however, went ahead and began designing and modifying larger models that were in the early radial design, or reversed automatically.

Commission agents, the middlemen in this industry then, were eyed with suspicion by most beekeepers, and the reputation was earned. Some, like Muth, were reputable though, and wrote to explain how to deal with agents. Details included weights, payments, references and legal settlements. Some things never change, it seems.

The Benton three-hole mailing cage had been successfully used for several years sending queens from all over the world to the U.S. A similar model had been used by the Root Co., but one side was covered with tin. The Root Co. modified Benton's cage, used exclusively for mailing, by covering one of the end holes so the attendants and queen could cluster if it got cold, and filled the other end hole with candy, covered with screen, but an entrance was provided through the screen so the bees could eat their way out, or in, for introduction. This cage was so successful, E.R. suggested the cage, which immediately was used by (*nearly*) everyone sending queens, be named after Benton, and paid him $50.00 for the use of it. If Benton only knew how popular it was to become, he might have asked for more.

National meetings were discussed, and it was decided that locations be moved all over the U.S. so everybody could experience one, and, the site should foster business, not pleasure. Some things have changed for the better, I guess.

There was a short article, toward the end of the year by Mr. Spafford, who suggested a new type of cover – one that 'telescopes' over the sides. This, his experience showed, improved ventilation, with or without a chaff or enameled cloth inner cover.

A.I.'s direction was becoming more focused by year's end. He wrote the Our Homes, Myself and My Neighbors and The Gardening columns, plus published an ABC of Strawberry Culture book.

E.R., G.M. Doolittle, C.C. Miller, A.J. Cook and other noted 'experts' were covering beekeeping better than he could, or wanted to, by now, and he could afford these other pursuits.

Nevertheless, the Root Company's business boomed. They fell 800 orders behind in May, and bought a million sections from another supplier just to keep up. Over 200 employees worked from dawn to after dark, and more expansion plans were in the works.

For A.I., and the Root Company, life was good, and by the end of the year they had reached 10,000 subscribers. BC

Mark Winston

La Maison du Miel

"North Americans tend to be somewhat primitive when it comes to how we value honey."

My wife and I recently returned from one of those dream trips that fall into your lap once in a great while. We were invited to France to speak at the joint annual meeting of two French beekeeping organizations, one representing queen breeders and royal jelly producers, and the other, pollinators. They were wonderful hosts, taking us to ancient ruins, incredible restaurants, and shop-until-you-drop local markets. Both of us quickly became absorbed in the French lifestyle and mode of thinking, and even after returning home, we continue to eat cheese for dessert and gesture emphatically while we talk. I've even considered taking up smoking so that I can linger in local coffee bars, drinking strong coffee and passing the day.

I know that stereotypes about other cultures tend to be glib, narrow-minded, and usually wrong, but even the French would agree that they really do pay a lot more attention to food than we do. They eat long meals, talk about every course in great detail, travel long distances to buy the best bread, wine, or cheese from a small, local merchant, and argue incessantly about which is the best *boulangerie* (bakery) in town. With this in mind, it's not surprising that both beekeepers and civilians are very picky about their honey.

One of the highlights of our trip was a visit to the Parisian store *La Maison du Miel*, roughly translated as "The House of Honey." I happened to read of its existence in a guidebook, and immediately insisted to my wife that we cross town on a rainy day to visit. I was intrigued that an entire store would exist that sold nothing but honey and honey products, and curious about how the food-crazy French would approach selling honey in the sophisticated Paris market.

The store is on a small side street near the famous Louvre art museum, and its business card advertises it as selling "honey from all the provinces, the most beautiful varieties and the best price." It also notes that the store is fairly new by French standards; founded in 1898, it is just coming up on its one-century anniversary. When I entered the store, the first thing to catch my eye was a beautiful tiled bee inlaid on the floor, looking very much like murals we had seen in restored ruins from the ancient Roman occupation of France.

The next thing that caught my eye was the bar. No, they didn't serve alcohol, but they did serve honey from all regions of France and a few other places around the world. The storekeeper was positioned behind the bar, handing out elegant, small silver spoons which customers could dip into any of the open honey jars on the counter for tasting. I quickly flashed on the innumerable times I've had a tacky toothpick thrust into my hands with which to taste someone's honey, looked at this classy spoon, and knew I was definitely not in Kansas anymore.

The honeys were almost all from France, labeled with floral sources, and the distinctive color and flavor of each honey made it obvious that great care had been taken to keep the honeys unifloral. They were organized by regions, with dark and light honeys arrayed in no particular order, including a small section at the end for non-French honey. Sorry, Americans, but U.S. honeys were not to be found in this store, although they did have the ever popular Canadian clover and buckwheat honeys, some extremely dark Turkish honey that looked more like strong coffee than honey, acacia honey from Hungary, and a honey that was scantily described only as "honey from Greece." Each honey was labelled as *sauvage* or *culture*, indicating whether it came from natural vegetation or from a crop.

My personal favorite was the lavender honey, produced in the region of southern France where I spoke to the beekeepers. This honey comes from the bright purple flowers of lavender plants raised to produce oils used in perfumes, and had a highly distinctive, lightly aromatic taste. I closed my eyes as I savored my spoonful of this ambrosial honey, with images of beautiful French models wearing high-fashion clothing dancing across my palate.

When I opened my eyes, I saw the price: About $8.00 a pound. While this was among the higher-priced honeys, even the cheapest multifloral blends were selling at $4.00 a pound. Attractively packaged, carefully displayed, elegantly handled, and easily sampled, the honeys we saw commanded a premier price. And the honey was selling; I saw a number of customers enter the store, purchase honey, and leave without the slightest indication that the price might have been a bit astronomical.

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"I was intrigued that an entire store would exist that sold nothing but honey and honey products, and curious about how the food-crazy French would approach selling honey in the sophisticated Paris market."

LA MAISON ... Cont. From Pg. 21

After purchasing the smallest jar of lavender honey in the store (the owner had to go down to the basement to find a jar small enough to contain my purchase), I began looking around the rest of the *maison.* The shelves were full of tastefully displayed honey products that went well beyond the kinds of goods I see displayed in North America. One counter had an array of nothing but sweet, dark, heavy breads, labeled as containing either 25 or 30 percent honey. On another counter was a collection of meads, each distinctively labeled like bottles of fine wine. There also was a section for beauty products, with a diversity of soaps, creams, and potions carefully exhibited for consideration. Scattered throughout the displays were honey candies to sweeten the palate while considering your purchases. My personal favorites were the almond, pine-nut, and walnut candies, with the subtle nut flavors mingling on the palate with the bold honeys with which they were mixed.

La Maison du Miel was not limited to honey. They also sold a range of pollen, propolis, beeswax, and royal jelly products, again with a hefty price tag on each. An ounce of pure royal jelly, for example, sold for $40, or about $640 a pound, about five times the price available on the world market today. I asked some of the royal jelly producers at the meeting I attended whether that price was typical, and they scornfully suggested that the going price for royal jelly in France should be twice that figure. Further, they intimated that the price quoted at the store could mean that the royal jelly came from a most unsavory source: an imported product, maybe even imported from China.

The propolis products were interesting because they also were labeled with the plant source from which they came. I don't know how accurately a store owner can determine propolis sources, or how mixed the propolis might have been, but differentiating between propolis types certainly is a clever marketing idea. Each product I examined did seem distinct in its colors, textures, and aromas, and I could see the Parisian customers developing preferences for propolis types, just as they would for honeys.

I did find a defect in one product, although it may be a defect only from a North American perspective. The comb honeys on display all had wet cappings overlaying the honey in the comb, which we on this continent consider a mark of inferior comb honey. The careful display and quality evident in the other products suggested to me perhaps French customers prefer wet cappings. Since they seemed extraordinarily picky about every other product, I imagine they wouldn't buy this one unless it met the highest standards.

The philosophy of the store was well-stated in their brochure, which begins by describing honey as "An excellent health food, containing vitamins, minerals, and oligo-elements (No, I don't know what an oligo-element is either, but it sounds healthy). A natural energy food, universally eaten, honey is consumed practically throughout the world. It contains the properties of the plants visited by the bees . . . ."

This image has remained with me, of the food we eat containing the properties of where it originated. The French focus on food goes well beyond gluttony. Rather, it is based on a deep philosophical perspective that considers food as a prime force that shapes our health and our mood. In that sense, honey is more than a simple food commodity, and eating honey enters the realm of an experience. Each honey not only has a special taste and aroma, but also provides a particular feeling to the consumer. Just as the lavender honey transported me to a world of high fashion, the dark Turkish honey can carry you to the narrow streets and markets of the Middle East, and the light, white Canadian clover honey speaks of endless fields and vistas.

I left *La Maison du Miel* with the feeling that we in North America come from a very young and primitive culture where honey is concerned. We treat honey as fast food rather than as a gourmet meal, and market it accordingly. Just take a quick look at the honey on your supermarket shelves, stacked to the ceiling in large jars with unimaginative labels and little to differentiate one honey from another. Compare your supermarket honey to what I've described from France, and you should quickly realize that we have a lot to learn from the French about how to appreciate, and especially how to market, honey and other bee products.

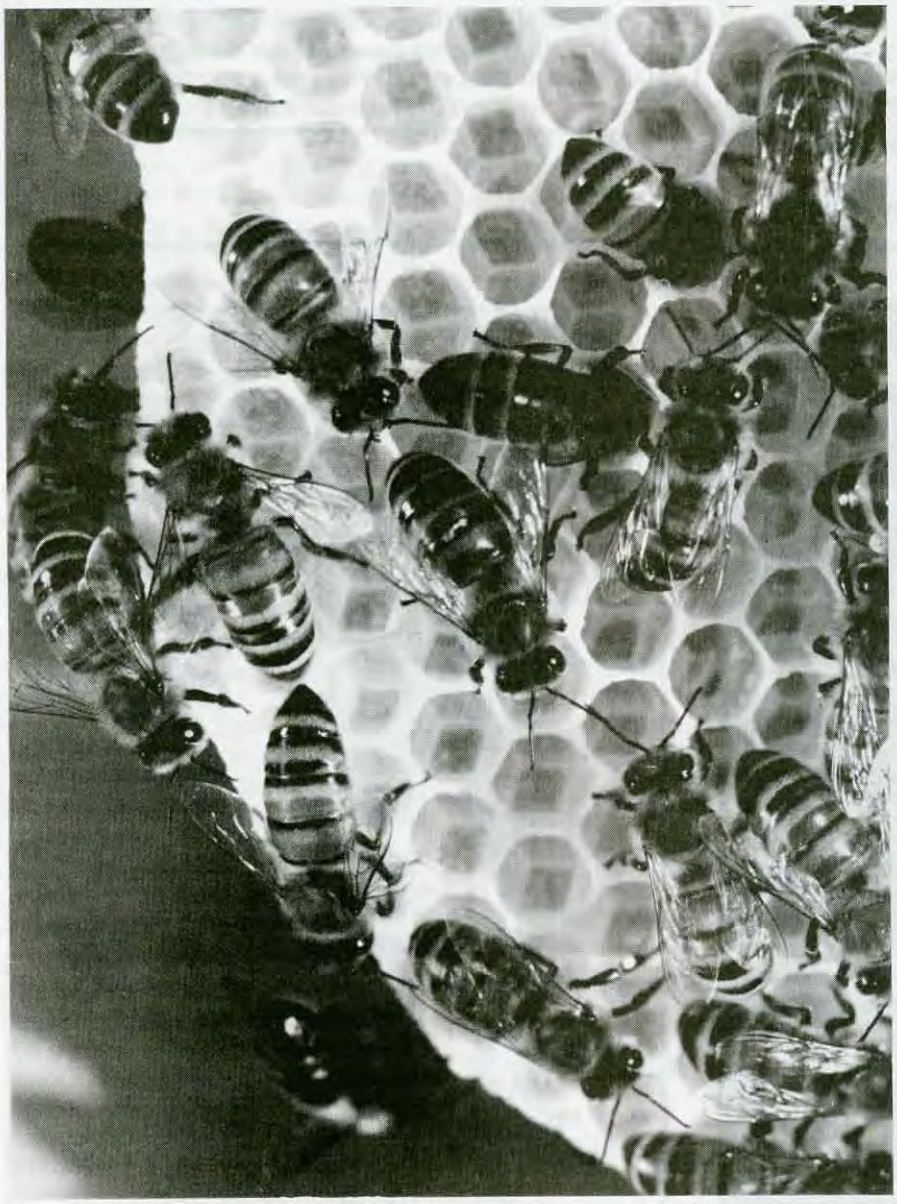
If you make it to Paris, stop in at *La Maison.* It's located at 24 rue Vignon, and the owner's name is Ets Galland. Tell her the nutty Canadian professor sent you, and ask for a taste of the private-stock lavender honey. *Bon appetit.* BC

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

Managing For COMB CONSTRUCTION

Stephen Pratt

Beekeepers depend on vigorous comb construction not only for beeswax production, but also for drawing out comb foundation and making high-quality comb honey. Until recently, however, little has been known of exactly what conditions stimulate bees to build new comb. Our research on this topic has yielded insights that may be useful to beekeepers interested in encouraging comb building, and in particular to those producing comb honey.



It has long been apparent that comb construction depends on an adequate supply of fresh nectar; the strongest building coincides with major nectar flows, and poorly fed bees will not build new comb. But it has not been clear whether it is the nectar itself that encourages building, or some other factor that depends on nectar intake. For example, bees might keep track of their current supply of empty comb and build new comb only when they begin to run out of space for honey storage and brood rearing. Such would be the case during a large nectar flow, as the accumulating honey filled up whatever empty comb the colony already possessed.

Monitoring its current supply of empty comb could help a colony avoid building at an inappropriate time. Worker bees produce beeswax in specialized abdominal glands which convert honey sugars into wax. This process is energetically very expensive, costing the bees at least five pounds of honey for every pound of wax produced. Secreting wax prematurely, when the colony already has plenty of empty comb, would be dangerously wasteful, since it would consume honey stores needed for Winter survival.

On the other hand, simply monitoring the amount of empty comb in their hive might also get the bees into trouble. If they build when they have nearly filled their available comb but are not collecting any fresh nectar, they waste energy on new comb which will not soon be needed. The timing of the nectar flows on which bees depend is unpredictable. When nectar is not available, a colony cannot know how long it will have to wait before the next bloom of nectar-bearing flowers. Rather than investing energy in new comb during such a dearth, a colony would be better off saving its resources to keep the colony thriving.

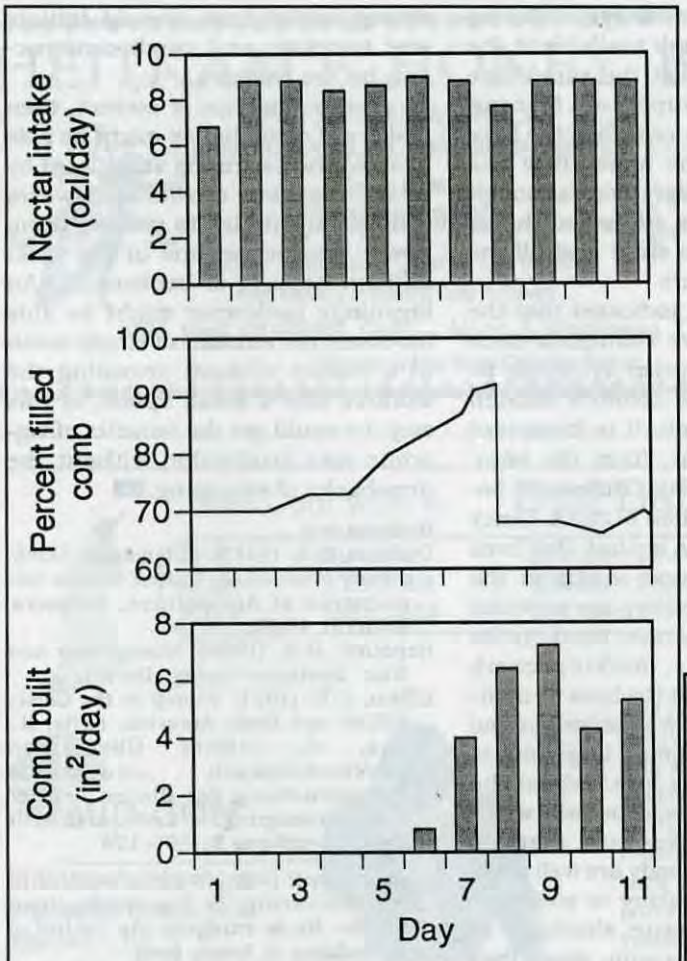


Figure 1: Results of an experiment showing the importance of comb fullness in determining when a colony of bees starts to build new comb. At the outset, when nectar intake was high but the colony had plenty of empty comb, the bees built no new comb. Only on the sixth day, once the bees had been allowed to fill much of their comb with honey, did they begin to build. Once they had started, the bees continued building even when they were again given ample empty comb.

Therefore, a colony may best time its new comb construction by building only when two conditions have been met: 1) They must be receiving a good intake of fresh nectar, and 2) The comb they already possess must be filled above a certain threshold amount.

Experimental analysis

We performed an experiment which showed that bees do in fact pay attention to the amount of empty comb in their nest (see Figure 1). A small colony in an observation hive was given plenty of empty comb and daily fed a large supply of rich nectar. Over several days, its honey-storage comb was repeatedly replaced with completely empty comb. This ensured that, despite the colony's high nectar intake, the bees always had plenty of empty comb in their nest. As long as this condition was maintained, the colony built no new comb. However, once we allowed the bees to fill up their available comb, they began building new comb vigorously and continued to do so as long as we continued to feed them. The bees apparently strive to maintain a threshold quantity of empty comb in their hive. As long as they do not fall below this threshold by filling up their comb with brood and food, they will not start to build more comb.

Interestingly, once the bees have begun to build, they stop paying attention to the fullness of their comb. When we again provided the colony with ample empty comb, they did not stop building, even though they were now well above the previously observed threshold level of empty comb (see Figure 1). Thus, the bees monitor comb fullness only to guide the start of a construction bout, not its duration.

But what about the nectar supply? Another experiment showed that construction also depends on a good honey flow (see Figure 2). We deprived a colony of nectar intake for several days by confining its foragers to a large flight cage devoid of nectar sources. At the same time, we made sure that its combs were always full of brood and food by regularly replacing partly empty combs with new combs full of honey. As long as the bees took in no nectar from the field, no matter how full their comb was, they did not build any comb. Once we provided them a feeder full of rich nectar they began build-

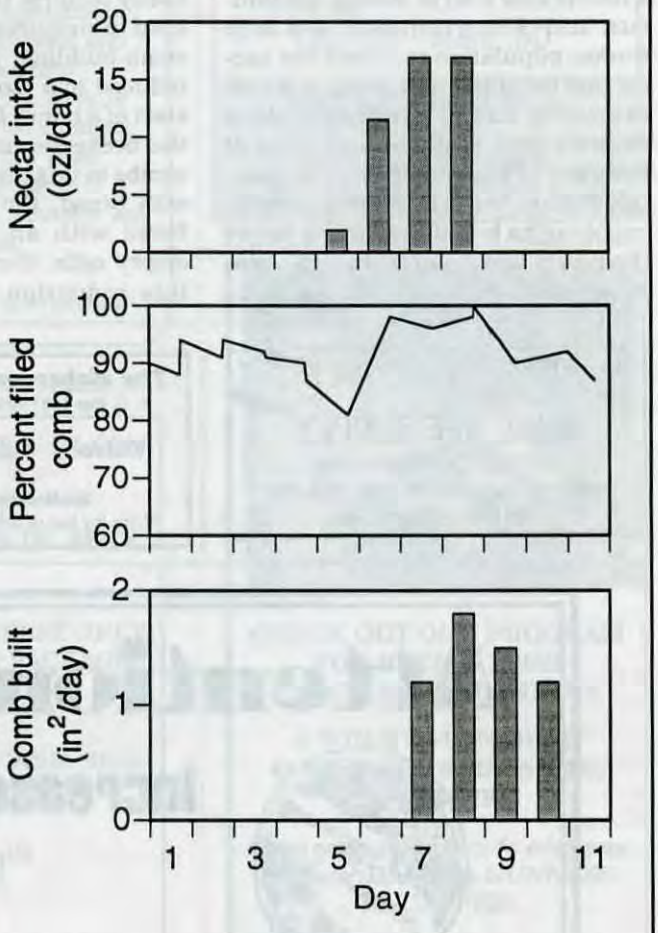


Figure 2: Results of an experiment showing the importance of nectar intake to new comb construction. At the outset, when the comb was largely filled with brood and honey but the colony received no fresh nectar, the bees built no new comb. Only on the seventh day, after the bees had started taking in large quantities of nectar, did they begin to build. They continued building only as long as they kept receiving nectar.

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COMB ... Cont. From Pg. 25

ing and continued to do so until we stopped feeding them.

These experiments show that bee colonies require both an intake of fresh nectar and comb filled above a threshold amount before they will start building new comb. The magnitude of this threshold for a full-size colony is unknown, but the small colonies (6,000 bees) used in our experiments built only when over 75 percent of the cells in the hive contained food or brood.

Comb honey production

These observations may shed light on the techniques used to make comb honey. For generations, beekeeping experts have insisted on three prerequisites for the production of high-quality comb honey: 1) a nectar flow that is strong, continuous, and of long duration; 2) a large worker population to collect the nectar and build the new comb in which to store it; and 3) crowding of these workers into a single hive body at the start of the honey flow. In practice, these requirements involve encouraging brood production before the honey flow by providing the bees plenty of comb in which to rear more workers, and then sharply reducing the amount of comb available at the start of the flow, at the same time the comb honey supers are first put on. The reason for crowding the bees at the start of the honey flow has not been well-understood, although some writers have suggested that it forces the bees to enter and fill the comb honey supers.

Our research indicates that the advantage of hive reduction does not stem from worker crowding itself, but from the colony's sudden loss of empty comb. It is important to remember that, from the bees' point of view, a major difference between the production of comb honey and liquid honey is that the bees must construct new combs in the former case, while they are provided with ample, fully drawn comb in the latter. Therefore, making comb honey requires that the bees be managed to encourage wax secretion *and* comb building. When a large hive is reduced to a single hive body at the start of a honey flow, especially when the beekeeper makes sure that the combs in this hive body are well-filled with brood, the colony is suddenly faced with an acute shortage of empty cells. Our results show that this reduction, combined with a strong nectar flow, should initiate wax secretion and comb construction by the workers.

If this analysis is correct, then makers of comb honey might be able to avoid the swarming stimulated by intense worker crowding. Swarm control contributes to making comb honey production one of the most difficult aspects of beekeeping. An ingenious beekeeper might be able to reduce the amount of empty comb in a colony without crowding the workers into a small space. In this way, he could get the benefits of vigorous wax production without the drawbacks of swarming. BC

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Stephen Pratt is a graduate student at Cornell University, in Neurobiology and Behavior. He is studying the control of comb building in honey bees.

PACIFIC NORTHWEST
POLLINATION REVIEW

Michael Burgett

This is the 11th year that the Honey Bee Laboratory at Oregon State University has reviewed the pollination economics of commercial beekeeping in the Pacific Northwest (PNW). This is the third year for which combined data are given for the states of Washington and Oregon. With each year's information, the strength and importance of our region's beekeeping industry is highlighted. All participants in a regional agricultural industry need to understand the vital role played by beekeeping in agricultural production. This is especially true today with the increased costs and problems caused by the presence of honey bee mite parasites and the slowly increasing geographical expansion of our honey bee's tropical "cousin" the Africanized honey bee.

The use of managed honey bee colonies for commercial crop pollination remains the most important function of this regional beekeeping industry. An enhanced knowledge of pollination economics is critical to every beekeeper who enters into the world of commercial crop pollination. It is also important for those growers who rent colonies to understand the current economic conditions of the beekeeping industry.

This year's survey provides data that continue to show a number of trends, one of which is the ever increasing dependence of PNW commercial beekeepers on the income generated from colony rentals. For 1996, the average commercial beekeeper received nearly 60 percent of his or her annual operating gross revenue from pollination rental. This is down from the 72 percent figure reported for 1995. This reduction is, at least in part, the result of the historically high prices beekeepers received for honey in 1996. Sideliner beekeeping operations reported that pollination rental fees represent 30 percent of their annual gross revenue. For the past five years, the average size of an individual commercial operation has been increasing; this was not so in 1996. This year, the average commercial operation reported 1,350 colonies compared to 1,348 for 1995; averages, which for statistical purposes, are identical.

I am aware of no region in the United States, or in the world for that matter, where honey bee pollination rental is of such importance to the economic survival of a regional beekeeping community. Even in California, the state with the largest and most varied beekeeping industry, pollination rental income is just slightly over 50 percent of operational revenues.

As in past years, the 1996 year survey was sent to all Washington and Oregon beekeepers who registered more than 25 colonies with their respective state agriculture departments. A total of 38 beekeepers returned completed surveys. The 19 commercial beekeepers collectively owned 25,682 colonies, and the 19 sideliners possessed 1,170 hives. A total of 81,843 colony rentals were reported for all respondents, which produced $2,571,678 in rental income. The average pollination rental fee, computed from commercial beekeeper rentals on all crops reported, was $31.55. This is a seven percent increase from the average pollination fee charged in 1995 ($29.60). Commercial beekeepers were responsible for 97 percent of all reported pollination rentals and a corresponding 97 percent of all pollination income. This is very similar to past years and shows how dominant commercial beekeepers are in the arena of large-scale agricultural pollination.

The amount of income generated from pollination rental is dramatically increasing. This is easily in-

Crop/Price Review

CROP	NO. RENTALS	AVG.	INCOME
Pears	4,462	$30.00	$139,356
Cherries	3,555	30.60	108,660
Apples	23,269	32.30	751,864
Berries[1]	4,538	19.70	89,350
Blueberries	1,787	23.70	42,360
Cranberries	1,450	30.50	44,200
Vegetable seed	3,417	31.15	106,421
Clover seed[2]	1,633	14.30	23,326
Crimson clover seed	666	7.40	4,932
Vetch seed	460	5.65	2,600
Radish seed	1,043	20.80	21,713
Sq. & Pump. seed	788	28.20	22,208
Misc.[3]	1,778	26.90	47,860
Almonds	30,273	36.25	1,096,654
SUM	**79,299**		**$2,501,504**
Average Pollination Fee		**$31.55**	

[1]Includes blackberries, raspberries, marionberries, & loganberries.
[2]Includes red & white clover as grown for seed.
[3]Includes arrow-leaf clover seed, birds-foot trefoil seed, turnip seed, meadowfoam, & holly.

Average Pollination Fees In Dollars, 1986-1995

1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
$14.75	16.15	17.50	16.05	18.40	19.45	19.25	22.50	28.10	29.60	31.55

ferred from the parallel increases in the average rental income generated on a per colony basis. Over the past five years, the average per colony rental fee has grown from $19.25 (1992) to $31.55 (1996). During this period the average annual revenue from pollination rental increased by a rather remarkable 246 percent (from $37,993 in 1992 to $131,625 in 1996). As economically wonderful as this appears, it needs to be remembered that colony maintenance costs and especially colony replacement costs are on a steep increase. Commercial pollinators require high colony numbers to survive, and replacement costs for the dramatic increase in colony losses, due in part to mite parasitism, is a heavy fiscal burden for all beekeepers. It needs also to be pointed out that honey bee colony rental has been an underpaid service for decades. It is really only within the past five years that rental fees have begun to reflect more accurately the enormous value-added service of managed pollination.

For the PNW, tree fruits are the dominant crops for pollination income. In 1996, the combination of pears, sweet cherries, and apples accounted for 40 percent of all reported rentals and 40 percent of all reported pollination income. Paradoxically, the most important pollination crop for PNW beekeepers is grown in California, i.e., almonds. This single crop was responsible for 38 percent of all rentals and 44 percent of all rental income in this year's survey. Almonds also provided the highest average pollination fee of all crops reported ($36.25). More than 95 percent of all commercial colonies in Oregon and Washington are taken to California for almond pollination.

For crops pollinated in the PNW, apples provided the highest average fee at $32.30 per colony rental. In terms of acreage, apples are the largest crop grown in the states of Washington and Oregon, which is reflected in the large number of reported rentals (29 percent of all reported rentals and 30 percent of reported rental income. The combination of almonds and apples accounted for 68 percent of all rentals and 74 percent of pollination income for PNW beekeepers in 1996.

The crops with the lowest pollination fees are the legumes hairy vetch ($4.60/colony) and crimson clover ($7.40/colony), both of which are grown as seed crops and are also traditional honey producers, hence a historically low fee. The situation is similar for our berry crops, which as late Spring to early Summer bloomers and copious nectar producers, often result in honey crops as well as a pollination fee.

The average PNW commercial honey bee colony was rented 3.09 times in 1996, and this includes California almonds. With the average rental fee of $31.55, this results in an average per colony pollination income of $97.50, which represents a new record high. For sideliner beekeepers, the corresponding figures are $27.60 for the average rental fee, with the average sideliner colony being rented 2.17 times for an annual per colony pollination income of $59.90. This lower colony pollination income reflects the reality that the majority of sideliner colonies are PNW residents and are not taken to California for almond pollination.

"An enhanced knowledge of pollination economics is critical to every beekeeper who enters into the world of commercial crop pollination. It is also important for those growers who rent colonies to understand the current economic conditions of the beekeeping industry."

The combined colony numbers from those commercial beekeepers who responded to the survey (25,682 hives) represent a conservative one-fourth of the commercial hives in Oregon and Washington. Therefore, if we multiply the pollination income ($2,501,504) by a factor of four, we have a ballpark estimate of the pollination income generated by commercial beekeeping in the PNW, i.e., slightly more than $10,000,000. This is less than one percent of the estimated farm-gate value of PNW crops that require or benefit from managed pollination. Pollination income in the PNW far exceeds the value of honey and wax sales for our regional beekeeping industry. Pollination rental income is frequently two and a half times greater than honey and wax sales in any given year, a situation that is largely ignored by federal and state agricultural economists, who continue to rely almost solely on honey and wax sales as the yardstick for beekeeping economic activity.

It needs to be remembered that

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Avg. Commercial Beekeeper Statistics, 1992-1996

Year	Average No. Colonies	Average Rental Fee	Average annual Rental Income/colony
1992	765	$19.25	$49.70
1993	990	$22.50	$62.25
1994	1,225	$28.10	$78.70
1995	1,348	$29.60	$78.15
1996	1,350	$31.55	$97.50

SUMMARY 1996

- A total of 38 beekeepers returned survey forms:
  19 Commercial (>300 hives) owning 25,682 colonies.
  19 Side-liner (<300 hives) owning 1,170 colonies.
- The average per colony pollination rental fee (for all beekeepers, for all crops including California almonds) was: **$31.40**
- The average commercial colony was placed in **3.09** pollination sets in 1996, with an average rental fee of **$31.55,** for an average per hive rental income of **$97.50.**
- The average sideliner colony was placed in **2.17** pollination sets in 1996, with an average rental fee of **$27.60**, for an average per hive rental income of **$59.60.**
- For 1996, **97%** of all pollination rentals were done by commercial beekeepers, who also accounted for **97%** of all reported pollination income.
- The average commercial bee operation maintained **1,350** colonies and grossed **$131,625** in pollination rental income for 1996.
- The average sideliner bee operation maintained **90** colonies and grossed **$5,391** in pollination rental income for 1996.

the data presented here represent the pollination rental situation of the "average" commercial and sideliner beekeeper. For individual beekeepers, the data are most useful as a benchmark against which they should compare their individual operations.

Over the past few years, honey bees have received a great deal of attention from the national media. Many stories have been and continue to be generated about the dire plight of the honey bee, our most valued and widely recognized beneficial insect. And there is no denying the serious losses of honey bees and beekeepers due to a combination of causes, most especially the heavy colony mortalities caused by parasitic mites. However, it is instructive to view the honey bee in the U.S. from three perspectives. The first is the wild honey bee population, which, in the presence of mites and without benefit of human caretakers, has indeed been dramatically reduced in population. Few accurate assessments exist for the current situation of wild honey bee colonies, but most experts will agree that the wild honey bee population has been reduced by as much as 80 to 95 percent. The second population of honey bees that has suffered greatly in the past decade has been the hives owned by hobby beekeepers. Beekeeping management skills vary widely among this largest of beekeeper groups. Those with insufficient knowledge, or the unwillingness to improve their management practices, have lost their bees. Again we have no accurate assessments for the reduction in hobbyist bees, but a figure of 50 percent would not be unrealistic. The third, and final honey bee population found in America, is that which is controlled by commercial and sideliner beekeepers. This critically essential population of honey bees is larger, economically healthier, and more vital than ever before. Losses of colonies from the wild honey bee population and from within the hobbyist ranks have increased the potential value of every living honey beehive. Commercial beekeepers have taken advantage of this opportunity.

I wish to thank again all those beekeepers in Oregon and Washington who took the time to participate in a survey which has now generated the most accurate assessment of commercial pollination known in the United States. BC

Michael Burgett is the Extension Specialist in Apiculture, University of Oregon.

This Season, Conduct A BEEKEEPING WORKSHOP

James E. Tew

If a picture's worth a thousand words, a workshop's worth a season's experience - for a beginner.

Not one of you currently reading this article learned beekeeping in an informational vacuum. To learn the craft, all of us read books, went to classes, meetings or workshops. We talked to other beekeepers (some with better acquired skills than others) and we made mistakes (some much bigger than others). And now, here we all are, each with varying amounts of experience and each with varying levels of proficiency.

Caused by bad or inaccurate information, we all have our personal "beginning beekeeping" stories. A confession of mine is that, in my early days, I really didn't understand the adult bee population cycle. Once a hive was strong, in my early opinion, I thought it should stay strong. My first two colonies, purchased as populous established hives, began to decline in late August/early September. I was frantic. Was this a case of the dreaded American Foulbrood? (I now pleasantly recall that we had no parasitic mites with which to contend.) I treated with Terramycin. I considered requeening. My bee hives were crashing and I was the inexperienced hive pilot. I talked to anyone who would listen. Someone, who in my memory now has no face and no name, explained to me that the decline was a perfectly normal event in colony's preparation for the up-coming winter. Oh....I guess I should have known that.

Conducting a Small Workshop

Workshops come in all sizes. It's no surprise that the larger the group, the more difficult to provide personal attention. But, again, it's no surprise that small groups take a lot of time. There's a need for both types of meetings, but not at the same time.

I think that the highest quality of "hands on" experience occurs during a well-run (somewhat) small workshop. Such an education experience is no accident, but rather the result of planning and preparation.

Let's suppose several things at this point. Suppose you are a member of a local beekeeping group - probably a county group. The group has a membership roster of 25-50 people. The average attendance at a regularly scheduled meeting is around 15-25 people. Now let's suppose the group has a few leaders who want to conduct an educational workshop. What now?

Group Support There must be general support amongst the members for conducting the training session. Though four or five members could probably pull the event off, it will be a lot of work for such a small training cadre. Spreading the work sure makes life easier for all.

Audience. Is your workshop for new beekeepers? Or is it for beekeepers having a few years experience? These are not the same groups. They have different needs. Invariably, participants exploring beekeeping for the first time, are "put off" when they are mixed with beekeepers already knowing procedures and jargon. Now here's the rub - you can advertise the workshop for people knowing *absolutely nothing* about bees - absolutely nothing - and people will still sign up who have been keeping bees for years. They can legitimately do that, but the instructors must stand by their educational guns and present elementary beekeeping information. Twenty to twenty-five people is a large group for one or two people to manage. More participants than that and the workshop is no longer considered to be small.

Time Should the workshop be the better part of a Saturday or should it be several evening sessions. Both choices have their advantages and disadvantages. Providing the meeting all in one day gives the participant a big dose of beekeeping - but then its over. Presenting sessions over a period of weeks gives the participant more time to assimilate information, and to use some of their new-found knowledge between sessions. It will require more scheduling on both the participants' and organizers' part, however. Surprisingly, I feel that the meeting location goes a long way in determining the type and length of the workshop. Either type workshop (one-day or sectional), should cover the same basic topics.

Location Though nothing is wrong with holding the training session at someone's home, generally, I would shy away from the first session being at a private residence. However, if the home site has a workshop building, a barn, or a honey house, I could easily change my recommendation. Participant numbers are everything. If there are only a few (5-10), meeting at a home is okay. Many more than that and the meeting should be conducted in an extension office, community center conference room, a grange hall, or a church building. Is there a suitable spot for a few hives of bees to be temporarily (and conveniently) moved to for demonstration purposes?

Promotions In theory, the more advertisements announcing the training sessions, the more participants - to a point. Commonly accepted mediums of promotion are: Bee magazines, newsletters, extension publications, local newspapers, local radio (occasionally TV) and posted flyers. Plainly give the title, the dates, the location, some of the main subjects, and one or two of the speakers. If there is a registration fee, that should

No matter the size of your group, stay organized, on time and professional.

be mentioned, too. Promotion is too often at the bottom of the priority pile, as it were, and you end up over-reaching those who are easily found, and missing new or non-beekeeping students. Focus your efforts on broader community releases. Do two or three newspaper announcements, at diferent times of the week.

Registration Fees I suggest breaking even - *at least.* Rarely are these programs considered to be income-generators, but neither the club nor instructors should lose money. I suggest developing an estimated cost and then choosing an appropriate number of possible participants and share the cost among them. Ten to fifteen dollars is a typical registration fee. Higher quality programs cost more.

Breaks Arrange for breaks with drinks and something to munch on. It doesn't take much, but it is always appreciated by the sweaty group. But it does cost somebody to move bees, to give up a day, or an evening to teach, and to provide all the props. It's far better to offer a payment, and be refused, than to *assume* somebody will do this for free.

Give Aways At the meeting room, have bee hives, smokers, veils, honey jars - anything to set the mood of the workshop. It doesn't really have to be important so long as it is "bee stuff". Have industry or extension literature to support the lectures. Ideally, have this in workbook form as a reference manual. Three ring binders or simple folders, pencils, an introductory book, a pad of paper, a schedule or agenda and a list of contact people (inspectors, association officers, extension contacts) should be considered.

Be, Stay and End – on Time It's so easy to wander or be too casual when getting a meeting started. It's usually necessary for the sponsors to be at the meeting site well ahead of time - it's difficult to set up a meeting at the same time participants are arriving. There is a fine line between being relaxed and being late. Start the session *no later* than 10 minutes after the announced starting time. End on time. (It's harder than you think).

The Program An introductory beekeeping course should cover: (1) Beekeeping Equipment - both hive equipment and beekeeper protective equipment; (2) Elementary Bee Biology; (3) Honey - both the nectar flow and honey processing; (4) Pollination Behavior; and (5) Diseases and Pests. Some suggestions for each topic are presented below.

(1) Beekeeping Equipment: All parts of the bee hive (discuss bee space at this point), smokers, hive tools, veils, gloves, and protective clothing.

(2) Elementary Bee Biology: Identification of workers, drones, and the queen, all stages of brood, propolis, both new and old wax, bee bread, both capped and uncapped honey, dancing bees, forager bees and guard bees.

(3) Honey: Nectar sources, how honey is fabricated by the bees, why honey flavors are different, how it is processed, and how it is stored in the hive.

Continued on Next Page

(4) Pollination: Why plants require pollination, how bees are helpful, grower or gardener perceptions of honey bee pollination.
(5) Diseases and Pests: American Foulbrood, Varroa mites, tracheal mites, pesticide kills. Tell how to contact the inspector for help. (Note: there are several more diseases and pest conditions than this, but I would not overload a novice beekeeper at this point in their development).

If "a picture is worth a 1000 words", then a live demonstration must be invaluable. As often as possible, there should be outdoor sessions. Participants should be clearly told to bring (or purchase) protective equipment. Keep stings to a minimum. If the bees are hard to control, either end the demonstration or make changes in order to calm the bees.

The Open Hive During the outdoor sessions, keep both the participants and bees under control. Be prepared to change your plans if the weather is bad. Keep in mind that an open hive is potentially excitable. Don't actually keep the hive open much longer than 20-30 minutes. Actually, an open hive session does not mean that the hive is actually open all the time. Maybe "Outdoor Session" would be a better name than "Open Hive" Session. Some of the topics that can be discussed outside, but with the hive closed are: Lighting a smoker, pointing out hive equipment attributes and defects, discussing the various features of the bee yard, and nectar and pollen sources.

When working your way through the open hive, provide information as though you are a tour leader. Stay in specific categories. For example, after lighting the smoker, and puffing the entrance (with appropriate comments), remove the outer cover and then discuss the inner features of the hive - especially the concept of "Bee Space" as was discussed inside. Show how the inner cover is reversed during the winter and discuss why. After all aspects of lighting smokers, smoking entrances, yard features, and exterior and interior aspects of equipment have been discussed, consciously change the topic to bee biology - or bee stings - or honey production. The important thing is to clearly change the topic from one to another. Too frequently, the discussion centered around an open hive demonstration is something like this, "Now here's some new wax - look at that, the frame nail came through where a mouse caused that damage...Look.. see that worker emerging?? Has anyone seen the queen?...How much would this hive sell for??...Is that a drone?...is my smoker out???" True, in this hypothetical scenario, information is being transferred, but it's being transferred in a haphazard fashion. Driving home later that day, you'll think of numerous points you should have made (but you're probably going to feel that even if you do present information in a structured manner).

The Soul of A Workshop

What has been provided thus far are the operative mechanics of a beekeeping workshop, but the workshop needs to be brought to life. It must be given a personality beyond the basic mechanics of conducting the training sessions.

Be Respectful Give everyone name tags. Call people by their names. Don't be the tough guy who can take innumerable stings. New beekeepers are frequently nervous and clumsy when dealing with bee stings. Be sensitive to their newness. Don't call attention to them.

Be Organized Keep the program and presentations *organized.* Importantly, be keenly aware that all beekeeping principles cannot be covered during these first workshop sessions. Answer all questions, but don't stray too far from the assigned topics. This is an important aspect of conducting a training program - Answer, or at least acknowledge, all questions that you take, but realize that you can't take all questions and stay structured and on schedule. Don't let either your indoor sessions nor your outdoor session become question/answer sessions - unless they were listed that way. There is an appropriate time for questions and answers, but resist the temptation to conduct your presentations in that manner. Use photographs and photographic slides as much as possible, when inside. After an outisde session, set aside some time, away from the colonies, to answer questions. Make suggestions, and, maybe, give assignments for people to "look for" in their own hives.

Blind Evaluations Ask for blind evaluations (later, you can try to figure out who made the comment by their hand writing). Ask specific questions concerning how the program was conducted. How were the facilities? The handouts? I would recommend that two specific questions be asked: "What did you like best and what did you like least?" Then be thick skinned. I normally don't read evaluations for several days. You'd like to think the sessions were perfect, but they never are.

Reward Having taught basic beekeeping to another, you have given that person a skill for life. You become part of their beekeeping development. If you do it well, they will remember you for life. There's not much money involved here for the instructor, but there is the potential for a bit of life-long satisfaction for a "job well done" with satisfied customers all around. Consider being the one in your club who initiates a basic beekeeping training program. Best of luck. BC

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

Efficiencies

Richard Bonney

When you go from hobby to business, it's the details that will make life miserable, or profitable.

As with almost any endeavor intended to make money, a beekeeping business must be built on efficiency. Since most of us begin beekeeping as a hobby or casual backyard operation, we do not necessarily stress efficiency as we start. We are in it to have fun. Then, if our operation grows, it's often random – a swarm here, a split there, pretty soon we have a bunch of hives. The realization of the need for efficiency often is slow in coming, but it manifests itself in all aspects of the operation – simplicity of hive configuration, compatibility of woodenware, location of beeyards, adequate vehicle and an appropriate extracting facility, for starters.

Once a backyard beekeeper does expand, life is different. The first change to be made is in attitude, or maybe philosophy is a better word. A hobbyist with just a few hives may devote two or three hours per week to the bees, lavishing care on each hive. A sideline beekeeper may find a few more hours per week for the bees, but it is unlikely that the time spent per hive can ever be high. For many it is hard to make this adjustment, from careful 30 minute inspections per hive, for instance, to something substantially less, way, way less.

Individual hives tend to lose their identity as your holdings grow. The bee yard is the unit of concern, with each colony in a yard receiving equal treatment unless there is some circumstance or condition which makes a particular hive stand out as needing extra attention. But generally speaking, if one hive needs to be fed, they all are fed; if one hive needs supers, they all get supers, and so on.

Outside influences are treated differently, too. A hobbyist takes what comes and adjusts. Rain today? Work the bees tomorrow. A sideliner may not have this option if both today and tomorrow are already scheduled for working the bees. Working in the rain or in other adverse conditions may sometimes be a necessity. Be prepared. Part of this preparation comes in recognizing that the bees may not always be as 'friendly' as you have come to expect. The hobbyist usually works slowly and carefully, disturbing the bees minimally. The sideliner is usually in more of a hurry, more abrupt. The bees respond accordingly. If you have worked your bees in the past with little protective clothing, you may find that you are suiting up a little more often, or even always, just as a matter of routine.

Standardize your supers, your frames and your suppliers.

The hobbyist probably has all of his or her hives in the back yard. The sideliner may have outyards. A hobbyist, arriving at a hive without some needed piece of equipment can probably walk a short distance to get whatever is needed. A sideliner with a similar need may have to make a round trip by vehicle from some distant outyard.

All of this points out the need for planning and forethought, with an end goal of greater efficiency. The gross planning is relatively easy. It is the little things that sneak up on us.

My own evolution as a beekeeper makes a good case study. I came into the craft very casually, as a two hive hobbyist starting with packages. My initial efforts were influenced by the local bee equipment dealer. He carried a well made but expensive line of equipment. His specific stock included shallow rather than mid-size extracting supers, frames with wedge tops and divided bottom bars, hook wired foundation, and solid wood inner

covers with an incorporated upper entrance. These became my standards.

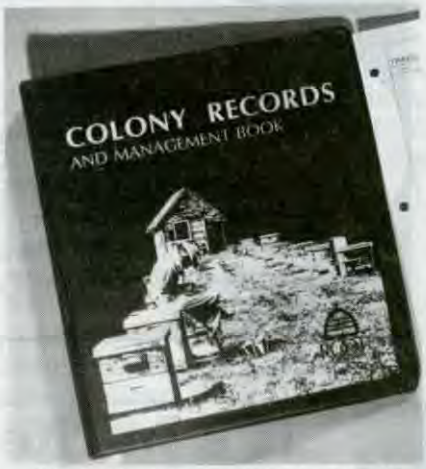
Then, as happens, I began to expand – a couple of splits for swarm control and then two swarms captured and I was on my way. I continued to patronize the local dealer for equipment for these four additional hives but I was fast realizing that his woodenware was comparatively expensive and some of the alternatives available elsewhere were of quite acceptable quality. This was important as I expanded to 20 hives, then to 40, and later to more.

I did plan as I went, and managed to avoid any serious problems, but I did learn of certain inefficiencies first hand. For instance, although woodenware from different manufacturers can *usually* be interchanged, some parts may not be totally compatible. For instance, frame top bars are available in different thicknesses. Frame rests are cut to different depths. When equipment from the different manufacturers is mixed, certain combinations of frame and rest can lead to gross violations of bee space, which in turn may result in lots of burr comb on the tops or bottoms of the frames. Then it becomes difficult to separate supers, slows down the inspection, and perhaps infuriates the bees.

The lesson I learned here was to mix sources as little as possible when acquiring woodenware over the years. Minor incompatibilities often compound to become major.

Another more significant inefficiency crept in during these early years. I mixed supers. Initially my extracting supers were shallows. My second batch were shallows. Then someone offered a good deal in used mid-size – 30 of them at a price too good to pass up. Now I had two sizes, shallow and mid, and somehow frames kept getting interchanged. At the hive I would take off a mid-size super and discover that the bottom inch of the interior was full of burr comb because the frames were shallow, or I would go to place a shallow super on a hive and discover that one or more of the frames were too tall and belonged in a mid super. This seemed to happen most often at a remote bee yard with no other super or frames available. A real mystery here is how I could get so far from home without noticing that some frames were too big. It has happened, though, more than once.

Speaking of outyards, lets look at them a little. New locations can be hard to find, and too often there is a tendency to settle for anything. As I was expanding I know I accepted at least a couple of spots that I later abandoned. Scout out prospective yards long before there is a need to occupy them, with an eye to year round vehicular access. If possible, visit there several times in the months prior to moving hives in. I was caught by a variety of circumstances in my yard selections. In one, the grower who owned the land laid irrigation pipes across the access roads periodically. I could not drive within a quarter of a mile of the hives when the pipes were in place. In another, I had to climb a steep grassy slope with my truck to gain access. In the spring when I moved in, no problem. In the summer when the grass was long, and especially if it was damp, I had no traction. Another long walk. A third location, though rural and remote, turned out to be in an area where kids hung out in the summer. A season of vandalism was capped by two hives being thrown into a nearby river.



Like real estate, good beekeeping is three things: Record Keeping, Record Keeping, Record Keeping.

Another consideration is the number of colonies a bee yard will accommodate. In some parts of the country this is of more concern than in others. In my area, for instance, many locations will support no more than six or eight colonies. In other areas, 20 or 30 colonies are more the norm. Sixty is fine in some places. You work with what your geography and nectar sources will support, but obviously it is better to have a lot of colonies in each of a few locations rather than a few in each of many locations. In the latter case, too much time and gasoline is spent traveling from yard to yard. The relative locations of your yards is important, too. Some think nothing of traveling two or three hours to a yard. That is tolerable for a very large and productive yard, or if there are other yards along the way, but if it is the only yard in that direction and then you must travel an hour or two in the opposite direction to visit a different yard, you are spending a lot of time on the road. Are you getting a proper return for your time and travel in terms of honey production?

Your vehicle also is worth some thought. I thought small, and acquired a small, two-wheel drive pickup truck at the beginning of my expansion. It and its successor both served me well for years, but a small truck does have limitations both in weight capacity and in the number of hives or equipment it can carry. For working my yards on a day-to-day basis the small truck was adequate. I could carry my working tools, spare hive parts, supers, whatever I might need routinely, with no problems. Occasionally, though, I needed something more, especially when moving a lot of hives for pollination. Eight hives per load was my limit, and that is not enough. A 20 hive contract, for instance, would mean three trips to move in the bees.

It was also with pollination contracts that the desirability of four-wheel drive was emphasized. Orchards and fields in New England where I live are notoriously hilly and difficult of access. What are they like in your area? In the Spring?

And little things creep up on you. As I expanded into my first outyard, remembering all my tools was not overly difficult. I had a metal pail in the back of the truck for my smoker, and a second pail, plastic with a cover, for the smoker fuel. I could stop by a nearby sawmill periodically and fill that pail with planer shavings. I threw everything else I needed into an open box. As time passed, though, and as I expanded more, my little *in*efficiencies began to hurt. Smoker fuel would run out at inopportune times, specific tools

Continued on Next Page

weren't on the truck when I needed them, or I simply didn't anticipate needs well. I learned, though.

I located a 40 gallon fiberboard drum with a tight-fitting lid for storing smoker fuel. I could fill it once per season and keep it in the barn. It became routine to top up my pail with fuel from the drum before leaving home to work bees. I bought a couple of plastic storage boxes with close-fitting lids for carrying such things as a hammer, pliers, a selection of nails and other fasteners, frame repair parts, a stapler, wire screening, grass clippers, crayons for writing on hive tops, and much more. All this equipment was dedicated to beekeeping and these containers stayed on the truck. No longer did I have to borrow, or forget to borrow, such things as grass clippers from the garden shed, or a hammer from my workshop, when it was time to work bees. I also routinely carried extra covers, bottoms, and other spare parts.

Of course, the best laid plans go astray now and then, and it is not possible to anticipate every contingency. I did occasionally forget something, or ran out of something. I learned not to trust my memory, though; I wrote things down. I carried a small notebook in the truck and as I finished working each yard I made notes of what to bring next time – more supers, spare bottom board, replacement frames, whatever was necessary.

I also used this notebook to record information about specific hives, noting for instance which needed requeening, or had potential for splitting, or for giving up a nuc. Checking this notebook before leaving home the next time insured that I took everything with me that I might need – a replacement queen, a nuc box, spare hives, or whatever might be required.

These are mostly small things that I have been discussing here, but so much of operating efficiently is taking care of the small things. They add up quickly when ignored. Take care of those small things and see how smoothly your whole operation goes. BC

Richard Bonney is an Extension Educator for the State of Massachusetts. He is a regular contributor to these pages.

Br. Adam gives breeding pointers to Roy Weaver during a week when he, accompanied by Mrs. Lesley Bill and Mr. Mike Powell were house guests of Roy and Lesley Weaver.

Well, Almost A Sage Is A Sage Is A . . .

B.A. Stringer

"Sages encompass plants of many different sizes, shapes, genera and species."

There are hundreds of plants commonly referred to as "sage," with a confusing array of common names. The true sages are those plants of the Genus *Salvia*, which includes over 750 species of annual, biennial and perennial plants of varying usefulness to bees. Let's take a look at the bee favorites of the *Salvias* and also a few other "sages" beloved by bees.

The well-known culinary herb Sage, *Salvia officinalis*, is a perennial attractive to bees for nectar. On the other hand, the popular scarlet sage bedding plants are frost-tender annuals that are of no use to bees as the long flower tube makes the nectar beyond the reach of a honey bee's tongue.

Two long-lived, ornamental sages that are extremely attractive to bees are Meadow Sage (*S. pratensis*) and Summer Sage (*S. x superba*). Both yield nectar over a period of several weeks and the plants are always humming with bees while in flower.

Meadow Sage is a native of northern Europe, where it is recognized as a honey plant. A hardy herbaceous perennial growing knee-high, this sage is occasionally found naturalized in the United States. The plant is highly variable, with flower color of bright blue, white, violet, rose or bicolor. Leaves are wrinkled with toothed edges, often speckled with red spots. The flower has a distinctly sickle-shaped hooded upper lip which is longer than the lower part of the flower. Spikes of the flowers grow up to three feet high. Meadow sage bridges the gap between fruit tree bloom and white clover bloom. Beginning to flower in mid to late Spring, the plants are in full bloom during May and are a good source of nectar during this period.

Summer Sage begins blooming as Meadow Sage is fading, continuing to bloom prolifically through most of June and July and again in Fall. This hardy perennial originated in Eastern Europe. It is believed to be of hybrid origin and was thought not to form viable seeds. However, in the 1940s, it was observed to set seed and reseed itself in the Honey Plants Test Garden run by Mr. Frank Pellett in Iowa. Seeds of two varieties of Summer Sage are commonly available. "Blue Queen" bears deep violet flowers and is compact and dwarf, while "Rose Queen," with bright pink flowers, grows to two feet. Both varieties have finely wrinkled greyish-green leaves and are very ornamental additions to the garden. Summer Sage and Meadow Sage grow well in fertile, well drained soil, and look impressive massed in flower beds.

Like other members of the Mint Family, sages have stems that are square in cross-section. The name Salvia comes from *salvus*, the Latin word for 'safe' or 'well,' referring to the reputed medicinal qualities of several sage species. The plants were used in ancient medicines to strengthen the memory and make people wise. About every three years, sages should be divided to ease crowding and to maintain vigorous growth. When the plants are dormant in Fall or early Spring, lift the entire root mass, then separate and replant the sturdiest divisions.

In 1906, Professor A.J. Cook wrote to the *American Bee Journal* about Californian sages. "Chief among the honey-bearing mints are the incomparable sages of California . . . marvelous honey producers, first, because of the generous secretions of each floweret, and second, because of the immense number of these flowerets and the long period of bloom." In California the three important sages contributing to the honey flow are Black Sage, White Sage and Purple Sage. Their honey is described as "water-white, unexcelled flavor, of heavy body and does not granulate." From Spring to mid Summer, Black Sage (*Salvia mellifera*) bears white to pale lilac flowers in several tiers around the stem, above dark green leaves. The

California White Mountain Sage, From 1877 ABC of Bee Culture

Continued on Next Page

A SAGE IS A ... Cont. From Pg. 39

small, inconspicuous flowers, as indicated by the species name, produce copious amounts of nectar. They then turn black after bloom. Other common names for the plant are Button sage and Blue sage. In 1914, the Black Sage was described as "king of them all" and in 1930, Frank Pellett wrote that "Quite probably it is the best honey plant on the Pacific Coast." However, warnings were given even in the early 1900s that the range of sages would become a thing of the past with the rapid emigration to California and the cultivation by plow of hillsides.

Purple Sage (*S. leucophylla*) is true to its name both in flower color and in the greyish-purple cast to its leaves. It grows larger than Black Sage and blooms a little later, providing nectar for bees to gather. White Sage (*S. apiana*) bears white flowers and grey-white foliage. It blooms from late May through July, but yields far less than Black or Purple Sages. Although the plants were as abundant as Black Sage, the honey was considered to be not as fine in flavor.

When is a sage not a sage? Let's look at some sages that are not *Salvia,* but are useful to bees. Russian Sage, *Perovskia atriplicifolia,* also called Silver Sage, is a hardy, silver-leafed shrub native to Himalaya. During its mid to late Summer bloom it has been described as "masses of purple lavender-like blossoms . . . covered with bees probing for nectar." This plant may grow head-high in full sun and well-drained soil, but may die to the ground in Winter and resprout from the base the next year. Like the true sages, it is a member of the Mint Family. *Perovskia* was named for V.A. Perovski, who was a Governor of a Russian Central Asian province around 1890. The specific name refers to the leaves being like those of the salt-bush Atriplex.

Sagebrush (*Artemisia tridentata*) is another plant frequently called sage. This is an evergreen shrub growing between one and 10 feet tall with aromatic, greyish toothed leaves. It is common on low hills and mountainsides in poor, rocky soil in many western states. Bees gather large amounts of yellow pollen from the tiny yellow flowers, particularly when few other pollen sources are available.

Yet another "sage" is the Bethlehem Sage, *Pulmonaria saccharata.* Flowers in the Pulmonaria genus, also called Lungworts, are minor sources of pollen for bees. Although they also produce nectar freely, even in cool temperatures, this is inaccessible to honey bees as it is secreted in the bottom of the flower tube and guarded by tufts of hair. The large, hairy leaves of most Lungworts are splotched with white or silver, almost glowing when these low-growing plants are established in moist, partly shaded sites. The flowers may be pink and blue on the same plant during the early to late Spring bloom.

Sages, then, encompass plants of many different sizes, shapes, genera and species, which vary widely in their usefulness to bees. They also demonstrate the ambiguity and confusion often associated with the use of plant common names. BC

B.A. Stringer raises and writes about honey plants and honey bees from her home in Blodgett, Oregon.

If You Produce Comb Honey . . .

BAIT SECTIONS

. . . May Be The Answer

Roger Morse

In comb honey production, it is important to have a partially drawn section in the first comb honey section super that is placed on a colony. This is called a bait section. Bait sections are especially important when making wooden sections in standard supers. The bait section will cause the bees to start to work in the section super more rapidly. It should be in the center of the super. I cannot explain all of the biology that surrounds these facts, but they were discovered and attested to by several of the outstanding beekeepers who produced comb honey a hundred years ago.

A proper bait section has the cells on comb foundation uniformly drawn about one-eighth to one-quarter inch. In a good honey flow, this should take about two days, sometimes only a day. The best time to make bait sections for the *following* year is in the middle of a good honey flow. The partially drawn sections should be stored so that they will not accumulate dust during the year. The bait sections should contain new wax only, not wax transferred from other comb. When making new bait, the sections should not be left on colonies so long that any honey is placed in the cells.

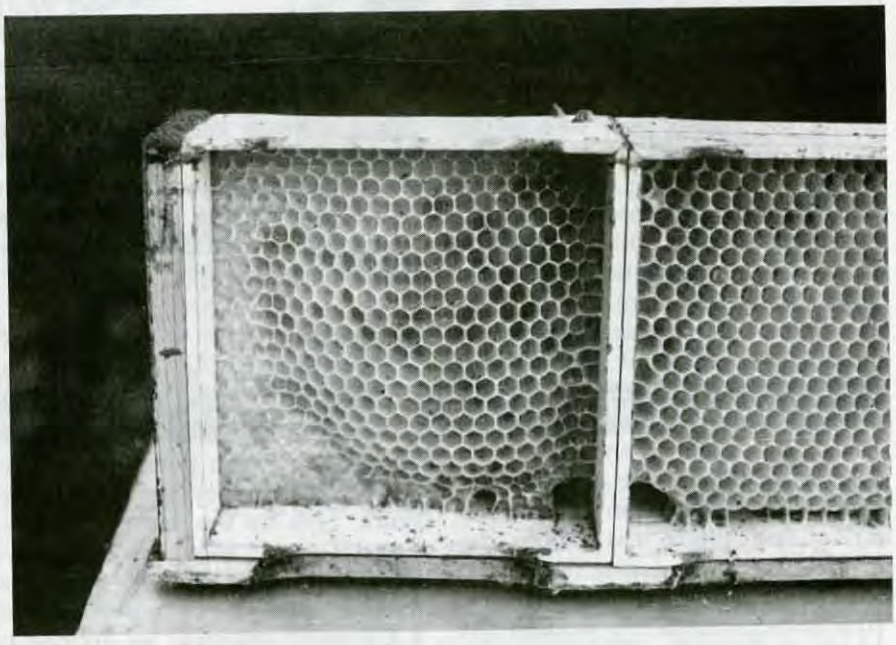
One may use partially drawn and robbed-out sections from the year before as bait sections, but bees will add wax to old comb, and the old sections will have thick wax cells that are tough to chew and have little taste appeal. If you use an old section as a bait section, it should not be sold or given to friends, but consumed at home or fed back to the bees. On the other hand, a bait section properly made with new wax in a short period of time will result in a tasty section the following year.

What does a bait section do?

The chief reason bait sections are important is that the top bars of the frames in the brood nest and the wooden section holder that holds the sections on the bottom of the comb honey supers make a barrier that the bees must cross. The bees must be enticed across this barrier. If one uses standard frames in a super, they will have top bars that are three-quarters of an inch thick. Above the top bars there is a bee space of three-eighths of an inch. Above that are the sections holders and the sections which together are another three-eighths of an inch thick. That is a total of an inch and a half of space the bees must cross to get to the foundation in the section super. This is a major barrier unlike anything honey bees encounter in nature. In fact, in a natural nest there are no barriers between the brood rearing and honey storage areas.

George Demuth, comb honey producer, former editor of *Gleanings* and author of the 1919 USDA bulletin *Commercial Comb-Honey production,* listed bait sections as the third most important consideration in comb honey production. The first two factors were the use of young queens and having an abundance of empty comb in the brood nest. Demuth wrote that there must be "prompt work in the supers at the beginning of the honey flow induced by using bait sections or extracting combs in the first super given, thus

Bait sections this advanced shouldn't be used for sale. They finish too waxy. Save and use again.



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SAVING TIME

Time is money – we've all heard these words many times before. But they seem to fit our high-tech world of today better than when the phrase was coined many years ago. Chances are, knowing the nature of comb honey production, the guy who thought up these immortal words was a comb honey producer. Lots of time-consuming work goes into comb honey production as anyone who has tried it can attest. So whenever we can save time, we become more efficient, and we can increase the profitability of our business, or so we hope.

I had been producing cut comb honey for a few years in shallow extracting frames. I followed the time-proven procedure of placing two-inch strips of foundation on the frames as starters. When the bees had the frame completed, the sealed comb was cut out, strips of foundation replaced, and then the frames were returned to the hive. One day, as I was performing the tedious task of replacing these two-inch strips of foundation, a thought suddenly struck me. Why not increase the depth of these frames by two inches and leave a two inch strip of drawn comb as a permanent part of the frame? So, after a few hours with the table saw, hammer, and nails, I had modified (deepened) some of my shallow supers with a two-inch strip of wood around the bottom. These supers would now accept my home-

made frames, which were also two inches deeper.

Being a cautious person by nature, I tried only a few of these modified supers at first to see how they worked. After all, an idea so simple had to have a down side. But surprisingly, as time went along, I found more advantages than just saving time.

After the sections of comb honey were harvested and the supers immediately returned to the hive, these frames with the two-inch strips of comb honey were very effective as bait sections. The bees were very quick to start a new crop of comb honey themselves. Since the bees are only adding comb to their strips, it is all virgin comb and there is no mid-rib foundation in the comb honey, so you get a noticeably less waxy product.

When replacing the delicate foundation strips, it seems there were always a few that either were crooked or became loose and fell out completely. With this new method, heavy, wired foundation actually works best, as it is easier to keep straight in the first place and also makes the comb more secure in the frame after being drawn out by the bees. Once you have a good, straight, secure strip of drawn comb in your frame, you overcome a lot of the work and fuss associated with comb honey production.

In the Fall, after the last flow has ceased, the supers can be piled outside where the bees can uncap and clean out the frames. This leaves a two-inch strip of drawn comb to start with in the Spring, which is more attractive to the bees than plain foundation.

Sound too simple? Not really. I've found the best things in life are simple. Best of all, my bees are working with me, turning time into money. BC

Randy Stieg is a comb honey producer from Reed City, Michigan, with time on his hands.

tiding the colony over one of the critical periods."

C.C. Miller, one of the best-known comb honey producers around the turn of the last century, had little to say about the value of bait sections except that they should be in the first super given a colony. He wrote, "Bees will start soonest in a central bait." However, if two bait sections were used, Miller said they should be placed in the corners or at least on the outside of the super.

In the 1910 edition of *ABC and XYZ of Bee Culture,* it is written that if one places extracting frames on the two outsides of a section super, "the bees immediately occupy the drawn comb at the sides of the super and begin their storing." The extracting frames should contain new comb only, as bees may use bits of old comb in the new wax in the sections and thus give them a dark appearance.

Exceptions

Not everyone agrees that bait sections are necessary. Eugene Killion, who won the first-place ribbon for his comb honey entries in the national honey show for many years, gave up the use of bait sections. He wrote about the bees managed by himself and his father as follows, "When our operation reached a thousand colonies, we decided it was a wasteful practice and discontinued using bait sections." The Killions used "T" supers in which the sections rested on metal upside-down "Ts". These eliminated the section holder, a quarter-inch-thick piece of wood.

I wrote Gene Killion and asked him about this. He replied that "Section holders do keep the bees from moving up into the new super." He went on to say that a friend had compared the "T" super with a standard super used for wooden sections and found that the "Killion super was almost full with the other super still empty."T-supers were perfected over 100 years ago, and the Root Com-

pany made, and sold millions in the late 1880s.

I am aware, too, that those who use round sections, which also brings the sections a little closer to the brood nest, often do not use or advise using bait sections.

What to do?

I still advise the use of bait sections whenever any type of comb section super is used. I think the bees will start to work sooner in any comb honey super if they are encouraged to do so. However, it is clear there are differences, and bait sections are not so important when one has less-thick top bars, "T," or round section supers that bring the bees in closer contact with the honey storage are. I think all of this is clear to many who produce extracted honey and use top bars that are only three-quarters of an inch-wide versus the (one and one-eighth-inch wide top bars that bee supply dealers sell. Wide top bars were designed originally to be used in comb honey production to help keep the queens out of the storage supers.

Designing an experiment to test the value of bait sections is not too difficult. I suggest using an extracting frame on one side of a section super to indicate the value of a bait section or bait frame. Either the bees will enter the section super on the side with the bait frame faster or they won't. And, the sections on the side with the bait frame should be better-filled. The problem with that last statement is that the outside sections next to the bait frame should be compared with the second row of sections from the opposite side since they are better-centered over the brood nest.

Comb Honey Production Is On The Wane

Very few beekeepers produce comb honey today. That's too bad, for there is no natural food that beats the flavor of fresh honey in the comb. Only round sections and supers holding square wooden sections are marketed at present. That limits one's opportunities. Producing comb honey is one of the greatest challenges in beekeeping, and little points are important in being successful.BC

Almost NO PAIN QUEEN REARING And Comb Honey Production

Carl Egolf

As a sideline beekeeper, my career has evolved over many years. I began with liquid honey production, then downsized to strictly round comb section production the last eight years. Over this time, my queen-rearing practices confirm the experiences of Steve Taber regarding multiple queens in colonies.

After one of upstate New York's long severe Winters, I inspected a colony that starved out because it could not move to fresh stores during an extended cold spell. Surprisingly, in the mass of dead bees, I found a marked queen on each side of a frame – the queen mother who had been raised and marked several years before and the queen daughter raised the previous Summer and introduced into the main colony during the Fall flow.

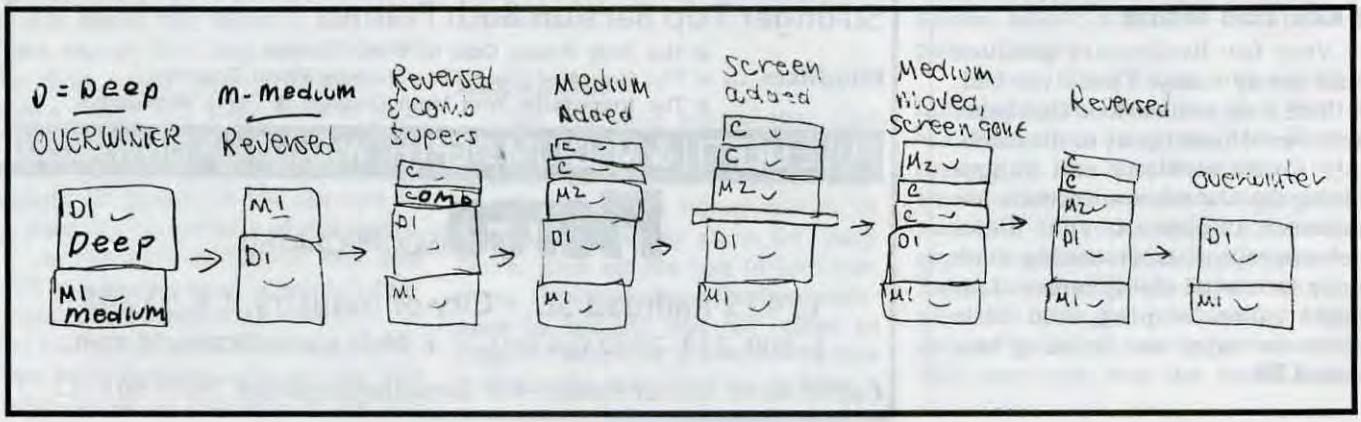
During my liquid honey production years, I permitted colonies to determine their own queen's destiny by superseding when they felt the necessity, usually every two to three years. In several exceptional cases, queens went into their fourth or fifth Summer before being superseded or in some instances, I split off a medium with brood and bees to raise a queen daughter to replace a failing queen. When sufficiently strong with emerging brood, the new queen daughter was re-introduced over paper to the parent colony.

Round comb section production necessitates almost annual queen replacement to assure vibrant, productive, non-swarming queens. In the area of mid-upstate New York, where I live my colonies have overwintered in one deep on a medium, being rotated one time in late Spring after a quick inspection for queen status. Prior to the early honey flow, the deep and medium are rotated again, with one or two round section supers placed on top, subject to colony strength. During the Summer, round section supers are added and removed subject to the honey flow and colony growth.

In late July or early August, an empty 10-frame medium is placed on the deep brood chamber of each colony, with its round section supers on top. In a week or less, the queen has entered the medium and established a sufficient brood pattern with ample pollen and honey stores and bees to permit separating the medium from the rest of the colony on a two-screen inner cover. A quick inspection of the medium will determine any presence of the marked queen to be removed to the main colony. The round section supers are returned to the deep with the scheduled queen-rearing medium on the very top on the two-screen inner cover. Field bees can egress through the seven-eighths-inch hole on the end of the medium to return to the main colony, leaving young bees to build queen cells to raise the new queen daughter.

Inspection of the mediums after three or more weeks will reveal a laying queen daughter with eggs and possibly larvae. The queen can be marked (I use quick-drying paper correction fluid available in assorted colors) with the current year's color. The new queen daughters of each colony are permitted to continue laying and building up nucleus strength in the medium for an additional three weeks or more until the new brood begins emerging. At such time, probably mid-September by now, round comb supers, if any, can be removed from the colony deeps; the new queen daughter mediums are placed on paper on the deeps, with their respective round comb section supers, if any, on paper on top of the medium, for introduction of the queen daughter and her court to the mother colony.

Round comb section supers can be harvested during the Fall flow, and the top mediums with honey stores when the Fall flow is ended



and the queen mother and/or queen daughter are clustered in the lower deep and medium with sufficient stores to survive another Winter. In my case, the removed mediums are extracted by fellow beekeepers.

The new queen daughter usually survives, as she is introduced on top of the main colony and is gradually forced down into the lower deep and medium as the honey flow progresses. By this means, colony strength and vitality are maintained by keeping the same "bloodlines" in each respective colony. While the yard is thoroughly hybridized, five separate lines are maintained with 20 percent of colony numbers maintained for each line. Some of my colonies are into their 13th and 15th continuous generations. The following Spring, inspection and queen color marking will determine which queen survived, although it is usually the queen daughter. The other main advantage of this system is that there is no need for a time-consuming, laborious, backbreaking search for the old queen mother in the lower hive bodies.

The major disadvantage of my management system is the necessity of removing the queen-rearing/mating mediums from their respective two-screen inner covers each time round comb section supers are added to or removed from the main colonies. This could be eliminated with additional bottom boards and top covers for the new queen mediums in an outyard until they are ready to be returned to the mother colony for introduction.

Although a time frame of about six weeks is required from original queen cell eggs to the emerging brood of the new queen daughter, the queen-mating time in mid-August assures an ample supply of mating drones. Mating and colony acceptance of queen daughters is practically 100 percent with a rare failure due to a queen being lost during mating flights.

Thus, this system assures easily managed queen daughter-rearing, mating and introduction of known bee stocks, with a minimum of physical hassle. BC

Carl Egolf raises comb honey, and new queens, near Newport, New York.

Ann Harman

Home Harmony

Comb Honey Kitchen Treats!

You're proud of it. Your bees are proud of it. And so you offer this beautiful piece of comb honey for sale - and the customers ask "What do you do with it?"

I have spoken to several people who put the entire piece of comb honey in the microwave, melted everything, and achieved scorched honey with a slab of wax on top. How sad. I certainly hope the bees didn't find out what happened to their efforts.

True, some people do know what to do with comb honey, but so many more really need to be introduced to that wonderful flavor of honey just as it is released from the comb cells. My children felt the best "candy" was a spoonful of comb honey dug from a frame with a spoon.

Historically, honey in the comb was the preferred way to buy honey since there was no chance of adulteration. Nobody has as yet figured out a way to construct wax comb and stuff it full of honey, much less sugar syrup. However, as consumers discovered ways to use liquid honey, and the threat of adulteration lessened (but it's still there for liquid honey), comb honey gradually lost popularity. Comb honey does not ship too well, either. The comb gets very brittle in cold weather and will melt if a package sits in a hot truck in the summertime. Perhaps these difficulties are to the advantage of the beekeeper. You can attract local customers and assure them that the best comb honey can only be obtained directly from a beekeeper.

Most honey producers are familiar with giving recipes, either as hang tags or as handouts. These work great for jars of liquid honey. But how many of us give ideas or recipes for using comb honey? Not enough, I'm afraid. So here are some suggestions. You can use the recipes given to encourage sales and use of comb honey or as a starting point for your own selection of recipes. A handout giving your favorite ways of using comb honey can be an important selling technique.

If the customers are encouraged to put the honey on hot biscuits, waffles, or corn bread, they will find that the comb melts down into the little holes and carries the honey with it. The comb then becomes almost "invisible" to the person tasting this delicacy. You do have to give reassurances that the wax is indeed edible. Tell your potential customers that the wax can be swallowed, can be chewed like chewing gum, or can be discarded. Remember that a clean product – not wax that has been repeatedly stomped on by bees – is conducive to eating.

These recipes give you a double chance to sell your honey since all the recipes need liquid honey as an ingredient.

HONEY BISCUITS

Biscuits are really easy to make. The only trick is to mix quickly and let the batter be lumpy. With this recipe you can cut biscuits quickly – biscuits don't have to be round.

2 cups flour
2 teaspoons baking powder
1/2 teaspoon salt
1/2 cup butter or margarine (cold)
1/4 cup honey
1 tablespoon milk

Sift dry ingredients together. Blend honey and milk. Cut butter or margarine into dry ingredients with pastry blender or two knives (pea-size is fine). Gently mix in honey and milk mixture (add more milk, if needed, until dough barely holds together). Form 6" x 9" rectangle, cut into six squares and then into triangles. Bake in 425°F oven 10 to 12 minutes, or until lightly brown.

Cooking With Honey!
Marge Davenport

TARHEEL BISCUITS

Not every biscuit is a baking powder-biscuit. Here's a recipe for a yeast biscuit. Yes, comb honey on these biscuits will be a rare treat!

1 package dry yeast
2 tablespoons lukewarm water
5 cups all-purpose flour
1 teaspoon baking soda
1 teaspoon baking powder
1 teaspoon salt
1 cup butter or margarine
4 tablespoons honey
2 cups buttermilk

Dissolve yeast in warm water. Sift dry ingredients. Mix honey with buttermilk. Cut butter or margarine into dry ingredients. Add honey and buttermilk mixture. Stir until flour is damp. Knead on a floured board for a minute or two. Roll, cut, and bake at 375°F for 12 to 15 minutes. Yield 3 dozen.

Honey Recipes
NC State Beekeepers Association

HONEY CORN BREAD

A piece of hot corn bread is always welcome. Cut your piece crosswise and put a chunk of comb honey on each half. Since corn bread always has nice holes, the comb honey will just settle in and give you a wonderful flavor.

3/4 cup cornmeal
1 cup flour
3 teaspoons baking powder
1/2 teaspoon salt
1 cup milk
1/4 cup honey
1 egg, beaten
2 tablespoons melted butter

Mix together dry ingredients. Add milk, honey, egg, and melted butter. Bake in greased 8x8x2-inch pan at 400°F for 25 minutes.

The Honey Kitchen
ed. by Dadant & Sons

HONEY WAFFLES

Waffles have holes, too, although they're big ones. Comb honey

will do just fine on a hot waffle.

2 cups sifted all-purpose flour
3 teaspoons baking powder
3/4 teaspoon salt
1 teaspoon cinnamon
6 tablespoons melted butter
2 eggs, separated
1-1/4 cups milk
1 tablespoon honey

Sift dry ingredients and cinnamon together. Add melted butter to beaten egg yolks; then add milk and honey. Pour this mixture into dry ingredients and mix quickly, just to moisten. Fold in stiffly beaten egg whites. Bake on a hot waffle iron.

Nature's Golden Treasure Honey Cookbook
Joe M. Parkhill

CHOCOLATE WAFFLES

Not every waffle is a breakfast waffle. These chocolate waffles can be a dessert, with comb honey, of course.

1-1/3 cups all-purpose flour
3 tablespoons unsweetened cocoa powder
1 teaspoon baking powder
1/2 teaspoon salt
1/2 cup sour cream
1/3 cup melted, cooled, unsalted butter
1/3 cup honey
4 eggs, separated
pinch cream of tartar
pinch salt

Sift together flour, cocoa, baking powder, and salt. In a small bowl, combine sour cream, butter, honey, and egg yolks. In a clean bowl, beat egg whites with a pinch of cream of tartar and salt until they hold stiff peaks. Add sour cream mixture to flour mixture and stir until just combined. Fold in egg whites gently but thoroughly. Bake in preheated waffle iron.

Honey Of A Cookbook Vol. II
Alberta Beekeepers Association

WHOLE WHEAT PANCAKES

Now for the pancakes. Certainly, comb honey works on pancakes. Put a piece of comb honey on each pancake as it comes from the griddle.

1 cup whole wheat flour
1 cup all-purpose flour
2 teaspoons baking powder
1 teaspoon baking soda
1/2 teaspoon salt
2 cups buttermilk or sour milk
1/4 cup butter, melted
1 tablespoon honey
2 eggs, beaten

Sift dry ingredients together. Mix remaining ingredients together and add to dry mixture. Stir until combined. Pour 1/4 cup batter for each pancake onto a hot, lightly greased griddle. Cook each pancake until edges become dry, and surface is covered with bubbles. Turn and cook second side until golden brown.

Ontario Honey Recipe Book
Ontario Beekeepers Association

BAKED FRENCH TOAST

French toast is another wonderful way to serve comb honey. You probably have your own quick way of fixing it. However, you might like to try this next recipe which is slightly different since the French toast is baked. It's an excellent way to fix French toast for a number of people.

3 large eggs
3/4 cup milk
5 teaspoons honey
1/2 teaspoon vanilla extract
4-8 thick slices of French or Italian bread
1/4 cup sweet butter.

Melt butter in 9" x 13" baking dish. Beat eggs, milk, honey and vanilla together until well-mixed. In a flat bowl, let bread sit in mixture about one minute on each side. Place bread in a single layer in the buttered pan and bake 15 minutes in 400° oven. Turn and bake an additional 10 minutes. Serves 4 to 6.

A Honey Of A Cookbook Vol. II
Alberta Beekeepers Association

You now have an assortment of recipes to give your customers - and to try out yourself!

INNER ... Cont. From Pg. 6

own agenda, their own special skills, and their own expectations. One of which is, if *my* gardening background can be relied on, is a relatively stable support group.

If you think beekeeping groups are something, you need to experience a Master Gardener's Program. With rare exceptions, and there are some, beekeeping groups don't hold a candle to gardening groups. That's because, I suppose, there's a lot more gardeners than beekeepers. Numbers mean money, votes and support.

This isn't a criticism by any means. Just an observation. Get ready for a slightly different breed of beekeeper. One with maybe more garden soil, than propolis on their jeans.

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No matter if you are the solitary type, don't attend meetings, and don't know another beekeeper, the problem of 'Too Many Bees' haunts us all at some time or other. Bee Management problems aside, the issue of family management can, and will rear its "us-or-them" head sooner or later.

The manageable number of colonies you have now (providing they are manageable) can get crazy-out-of-hand during swarm season. Two or three of yours swarm, you pick up one or two, and a couple get divided so they don't swarm. Suddenly your simple-hobby-five have grown to two yards of six each, and your investment has tripled, and your time has, well . . . gone away.

You may already be there if you live in the south, and what are you going to do? Those of us in the north are just beginning to face this seasonal dilemma. You can join these, sell (a real good choice) or expand. No matter your choice, or your plan, don't let your bees run your life. You're in charge. Make sure you, your bees, and your family know it.

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Do something different this Spring with your group. Light a smoker with damp fuel, tie veils with knots, use a hive tool. Pry up some real stuck-tight frames, and some stuck-together supers. Clean burr comb and propolis off top bars and inner covers. Clean a bottom board, and a dead colony. Replace a busted super with a new one. Relight that smoker. Deal with a bee in your veil, and your pants. (Drones work well here, if you're a bit squeemish.) Drop a frame full of bees, on purpose, and fix it. Tip over a super full of bees, and fix it. Incite robbing, and fix it. Open a colony without smoke on a cool, cloudy day, just to see what happens.

Make mistakes. Do stupid, ignorant, crazy, even dangerous things. All under the watchful eye of somebody experienced enough to save your sorry self if it really does get out of control, of course.

Anybody can do the easy stuff. If you want the beginners in your group to really learn what beekeeping's about, show them what will go wrong, and how to fix it.

Horror stories are fine for the old timers. Don't let those brand new beekeepers quit before they ever get started, just because nobody took the time to explain all the things that can, and will go wrong.

Be prepared.

Kim Flottum

?Do You Know? Answers

1. **False** Honey bee colonies are normally not moved into a crop until the flowers become attractive to bees. If bees are moved in before the crop begins to bloom, the foragers will become locked in on other floral sources. Bees will not shift to the target crop when it begins to bloom, until they become dissatisfied with the other floral sources they are working at the time. In some crops 10 to 25 percent bloom is recommended, however, if primary blossoms produce the choice fruit as in apple and strawberry, bees should be moved in at the very start of flowering.
2. **False** Foragers collecting pollen from flowers are considered to be the most efficient pollinators since they actively work the anthers for pollen. In doing so, more pollen is deposited on their bodies and there is greater chance of making contact with the stigma. In a few crops, honey bees learn how to extract nectar from the flower without contacting the reproductive structures. This nonpollinating behavior is quickly learned and once established, the forager is unlikely to deviate from it.
3. **False** Tart or sour cherries are self compatible and leading commercial varieties are planted in solid blocks of one variety. Most sweet cherry varieties, however, are self incompatible and require cross-varietal pollination.
4. **False** Honey bee colonies are commonly rented for pear and plum pollination but are not normally rented for peach pollination. Most peach varieties are self-fruitful and the bloom is very attractive, often resulting in over pollination. Many plum and pear cultivars require cross-varietal pollination and pears produce nectar with a low sugar concentration, so the flowers are unattractive compared to other fruits.
5. **True** Cranberry blossoms are reported to be poor producers of nectar and pollen, thus honey bees are not eager to work them. Other floral sources in the area of the bogs often are more attractive to honey bees. Two characteristics of the cranberry flower fortunately balance out its unattractiveness to bees and aid in fruit setting. The cranberry pollen grain is divided into four cells and is capable of producing four functional pollen tubes, thus requires less pollen transfer. The long flowering period (approximately four weeks) helps insure that a sufficient number of blossoms will be pollinated.
6. **False** The leafcutting bees differ from most other bees in that the females of the pollen-collecting species have the pollen brushes on the ventral side of the abdomen rather than on the hind legs.
7. **False** The alkali bee is a highly gregarious solitary bee that nests in large numbers in saline soils with a silt loam or fine sandy loam texture.
8. **True** Parthenocarpic fruit are produced without fertilization, and so there is no need for pollination in such varieties.
9. **True** When a flower contains both functional male and female sexual parts, the flower is referred to as being complete, perfect or a hermaphrodite.
10. B) Alfalfa
11. A) Stigma
12. A) Carpenter Bees
13. Adverse effects on the colonies from overstocking an area, which may be necessary to achieve maximum pollination.

    Damage to the colonies by pesticides applied to or near the target crop.

    Pollination services may be needed at the same time as a major honey flow in the normal location, resulting in reduced honey production.

    Increased potential of colonies becoming infected with bee diseases, mites etc.

    Wear and tear on the colonies and equipment.

    Hard work, normally done at night.

    Loss of queens, bees due drifting, and swarms since management is difficult.

14. Solitary- The female prepares and provisions the cell with pollen, deposits the egg, and then seals the cell completely unassisted. More than one cell may be constructed, but only one at a time. After the cell is sealed, no further attention is given it, and the adult may die within a few days.

    Gregarious- Solitary individuals that endeavor to nest in close proximity to each other but do not assist each other in cell construction.

    Social- Bees live together in a society and have divided duties. The queen is the sole or primary egg-laying individual and is assisted by her offspring in caring for the brood. Multiple generations are present in the society.

15. Wind, Rain
16. Bees, Flies, Beetles, Birds, Bats, Moths, and Butterflies
17. Fruit
    Seeds

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

Richard Taylor

Bee Talk

"These experiments were repeated many times, and always with the same results."

It gets very cold up here, but today (February 21) a freak weather pattern sent the temperature into the 60s. So I had a look at my favorite apiary, which I hadn't seen in nearly four months. A cow had shoved one of the hives off to one side, but it was still upright, and three covers were half off, but bees were flying from every hive, and I got the impression the colonies were very strong. What a contrast to last year! This portends a bountiful year, and if prices remain high we should be able to do pretty well.

I have lately been talking about some of Tom Seeley's remarkable research into honey bee communication. Now I'm going to say a bit more about that and then, next time, with Spring coming on, I'll get refocused onto what is going on in the beeyards.

Beekeepers, myself included, are constantly amazed at how fast bees sometimes store honey. We put supers on, and then, a week or so later, check to see whether the bees are working in them, and find most of them filled. How could they have gathered so much nectar in so short a time?

Part of the answer lies in the efficiency with which a colony deploys its foragers to all available sources rather than concentrating them on the most profitable ones. Thus, while a bountiful source of nectar, like a stand of basswood trees, will have lots of foragers, and a lesser source, such as a small patch of sumac, will have far fewer, *both* sources are exploited, by foragers whose numbers are proportionate to the amount of nectar available there.

The exact manner in which this maximally efficient deployment is achieved, Dr. Seeley found, is through the so-called waggle dances of the returning scouts. The richer the discovered nectar source, the more lively the dances; that is, the more numerous are the dances of a given scout in a given time. If the nectar source is not so good, then a returning scout performs a lethargic dance. Now Dr. Seeley showed that the bees in the hive, the ones that are about to be recruited to these sources, do not wander among these returning scouts and select the more lively dances. Instead, each such bee follows just one dance, be it a lively one or a slow one, and then responds to the message conveyed by that dance behavior by flying out of the hive in search of the indicated target source. This was shown by the experiments described last time. Thirty marked scout bees were trained to each of two feeder stands, one containing a strong sugar solution and the other with a carefully measured weaker one. All the other bees arriving at these stands, that is, the recruits, were captured, and later counted. The precise numbers of dances performed by the scouts from both feeders were recorded, and it was found that the number of bees recruited to each feeder bore an exact ratio – approximately 90 percent and 10 percent respectively – to the number of dances performed for each one, notwithstanding that the number of scouts was kept to the same number, namely 30, for each. All other factors, such as distance from hive, degree of scent, etc., were kept constant. Only the richness of the two target sources was different, and with this difference went a difference in the number of dances performed for each, and with this, the number of recruits to each.

This experiment was repeated many times, with carefully proportioned differences in the two sugar solutions, and always with the number of bees recruited to the feeders exactly proportional to the number of dances performed by the scouts for each feeder.

The most remarkable experiment, however, which was performed on two different days a week apart, involved the following change: The number of marked scouts going back and forth from the hive to the *stronger* feeder was cut down to five, all the other bees arriving at that feeder being captured and counted, while the number of marked scouts visiting the weaker feeder was kept at 30. Dr. Seeley figured that, if his interpretation of these experiments was correct, then he could expect to find more bees recruited to the weaker solution than to the stronger one. More precisely, the scouts visiting the richer solution, now numbering only five, would perform more dances *per bee*, but many fewer dances altogether, being greatly outnumbered by the scouts visiting the weaker one. So the dances by both groups of scouts were carefully counted, and the number of bees responding to the dancers from each feeder also noted, and it was found that only 17 percent of the total waggle dances were performed by the five bees visiting the stronger feeder, and this was almost exactly the percentage of bees visiting that feeder. So in other words, the experimenter had played a trick on the bees, leading them to deploy most of their foragers to the weaker source! Most important, however, is the fact that

the numbers of foragers sent to each feeder was in almost exact proportion to the numbers of dances (not numbers of returning scouts) performed for each feeder.

Of course, these waggle dances function to indicate not only the locations of food sources, but also the locations of potential nesting sites when a colony swarms. Thus the scout bees, returning from such potential sites, dance on the surface of the swarm cluster and thus indicate distances and directions in exactly the way they indicate locations of nectar and pollen. But these scout bees, returning to a swarm, are never found to be carrying nectar or pollen. They are looking for possible nesting cavities, not for food. A patient observer can watch these dances on the surface of the swarm, decode them, and then go locate the potential nesting sites thus indicated, where he will find scouts from the swarm checking them out.

One very interesting difference between a nesting site dance and a food source dance has been quite recently discovered; namely, when a returning scout does a waggle dance to indicate a food source quite near the hive, then it is fairly sloppy, the figure-eight pattern being somewhat flattened and the middle part, which indicates direction, somewhat vague. What such a dance conveys can be expressed as: "Search in the general area of the hive, more or less in this direction, and you will easily find it." But if what is indicated is not a food source, spread over perhaps an acre or more, but is instead a hole in a hollow tree, then the figure-eight shape is neatly adhered to and, most important, the middle part of the dance, indicating direction, is very precise, even though the hollow may be close to the hive. Why? Because a hole in a tree is not so easy to find as a spread of bloom, even when nearby, and the dance must indicate its direction (in relation to the direction of the sun, as always) with some precision.

Think about this, and see if you find it amazing, as I do.

The behavior of swarms and, by this time, of scouts seeking out nesting sites, is of course well-known, as swarms are numerous and easily observed. But early in his career Dr. Seeley wondered what happened at the other end; that is, at the newly discovered nesting site itself. What sort of criteria do bees use in deciding what will be a suitable site? They do choose among them; or, if you prefer, they somewhat laboriously and painstakingly select just one site to abscond to, in preference to the several other possible sites that their scouts discover and return to report on. So what, exactly, are they looking for? Significant considerations are the size and location of the entrance – for example, a hole in a hollow tree – height from the ground, and, above all, volume. The entrance must be neither too large nor too small, and similarly, the volume or size of the hollow must meet their requirements. Dr. Seeley had learned, from cutting down and measuring the nests in 21 bee trees, what the approximate limits of volume were; that is, how small a volume of a hollow was too small, and what was too large.

But that raised the interesting question: How does a scout bee *measure* the volume of a given hollow?

Not, it turns out, by sight. That is, the bee does not peer into a hollow to see how big it is. Dr. Seeley showed, with light meters, that there is seldom enough light inside a hollow tree for this to be possible.

What he did find is that the scout bee, coming upon what might turn out to be a suitable nesting site, measures its volume primarily by walking around inside it – much as you or I might assess the size of a garden plot by pacing it off. He discovered this by making a nest box in the form of a vertically placed cylinder, with a fixed entrance hole at the top, the rest of which could be rotated. A window in the top enabled him to see what any bee might be doing in there. The volume of this cylinder was on the borderline between what bees would find too small and what they would find barely large enough. Then he took this device to an island off the coast of Maine where there are no bees, set it up in a little observation hut, and took a small swarm (about 2,000 bees), each individually marked, to the opposite shore of the island. He then retired to his hut and patiently waited. Eventually a lone scout bee found the cylinder and its entrance hole, entered, and began her inspection, primarily by walking around inside.

Now, by carefully rotating the nest box to the left or right Dr. Seeley was able to mislead the scout as to its volume. Thus, if the bee started walking around to the right of the fixed entrance, and the cylinder was simultaneously and slowly rotated to the right, then the bee would be under the impression that she was covering less distance than she was, in relation to the entrance, whereas if it were rotated to the left, when the bee was walking to the right, the volume would seem to the bee to be more than it actually was. Dr. Seeley reasoned that if the first scout bee to inspect his cylinder found that it seemed to be large enough for a nest, then she would recruit more bees from the swarm to come and inspect it, whereas if it seemed too small, then she would recruit few or none. And this is precisely what happened, in repeated trials of the experiment! Many more bees from the swarm – upwards of 30 – would come and check out the cylinder if the first scout had been misled into believing that it was of ample volume, whereas only two or three would show any interest if the cylinder had been manipulated to make it seem smaller than it was.

The first scout bee to find a promising nesting site does a thorough job of measuring it, walking approximately 50 meters altogether, and if it meets her expectations she recruits other bees from the swarm to come see what she has found. Meanwhile, a scout bee will sometimes stand guard at the entrance to make sure scouts from another colony do not come and try to take it over. If this promising site then turns out to be the best, from among the others that scouts may have found, then more and more bees from the swarm come to have a look at it until, in time, agreement is reached in the swarm that this is indeed the best choice, whereupon the swarm abruptly takes wing, flies to that spot, guided by the scouts, moves in, and a new, working colony of bees has come into being.

I find this all deeply inspiring and, at the same time, filled with mystery. BC

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

Questions?

Honey Plants

Q I have four colonies, and I want to plant some nectar-rich flowers in an area of about 100 x 100 feet. What, in that limited space, would be most beneficial for them? I am thinking of alfalfa and clover mix, but perhaps various wild flowers would be better. What would you recommend?

Tom Stevenson
Clayton, NJ

A I think that, no matter what you plant, it will make no noticeable difference to your honey crop, though you can, of course, have the pleasure of seeing the bees on the flowers. This can be a genuine source of enjoyment. What you plant depends on the soil. Alfalfa and clovers yield nectar on some soils but not others; see what farmers plant in your area. Buckwheat is another possibility, but requires very special soil conditions. My suggestion would be that you plant squashes and cucumbers, which supply pollen and nectar, require relatively little attention, and give you something to show for all your trouble. Wild flowers, other than those that cover large areas, like goldenrod and purple loosestrife, are not significant nectar sources.

Comb Honey Singles

Q Are single brood chambers adequate for comb honey production? I met a commercial producer of comb honey who uses them exclusively in Virginia.

E. L. Scofield
Virginia Beach, VA

A I have found that bees Winter perfectly well in a single story even through the cold Winters we have in New York, but it is essential that these hives be very heavy with honey in the Fall. This means letting the bees have the Fall honey flow for Winter stores. The advantage of single-story hives for comb honey is that the bees work in the supers sooner, but they also encourage swarming, and you are likely to get pollen in the comb honey.

Using Used Comb

Q I want to revive Winter-killed hives with package bees in April. Can the existing brood comb and capped honey be used, or should these be exposed near the bee yard for the bees to clean out? The problem seems to have been Varroa mites.

Dan Fink
Palmyra, PA

A If, as is most likely, the colonies were killed by mites and not American foul brood, and if they are relatively free of rotting dead bees, wax moth residue, vermin and mouse nests, then you can install bees directly into them and they will build up very fast.

Lost Resistance

Q Doesn't one lose any advantage of mite-resistant strains of bees when new queens from such stock mate with Italian drones?

Mitchell Drinnon
Sneedville, TN

A That is correct. Since it is impossible to control the natural mating of virgin queens, it is impossible to retain the advantages of any particular strain beyond the first generation.

Pollen, Or Not?

Q Twelve of my 14 colonies are alive and strong this Spring and I am making up extender patties using Crisco, sugar and TM. Is there any reason why I should not mix some pollen into the patties? I have quite a lot on hand. Some of the bees are slow to use the patties and I thought a little pollen in them might help.

Scott Guiser
Bedminster, PA

A That is probably not a good idea. Extender patties are effective not only against American foulbrood, but also tracheal mites and the object is not to get the bees to consume them more quickly. The purpose of the Crisco (or other vegetable oils) is to make the patties last longer, and also to impart small amounts of the oil to the bees themselves as a repellent to the mites.

Requeening How-To

Q Would it work to requeen a hive by putting the new queen into a three- or four-frame nuc, wait three days until she is laying there, and then, without removing the old queen, install the nuc with the new queen, bees and all, back in the hive? If so, where in the hive should the combs with the new queen be put?

Charles McDonald
Baton Rouge, LA

A It would probably work. I'll know better this Spring, because I am going to requeen an entire apiary that way. An excellent beekeeper I know has used this method, using marked queens so he could check acceptance, and he assures me it worked for him. It is important, however, to have the new queen with the combs and bees from the nuc in a *second story,* above the story where the old queen is. It is claimed that a young queen, coming down from above and encountering an old queen below, is the one that survives the ensuing conflict of the queens.

Send questions to Dr. Richard Taylor, Box 352, Interlaken, NY 14847 (not Medina) and enclose a stamped envelope for direct response.

Answers!

Richard Taylor

Gleanings

APRIL, 1997 • ALL THE NEWS THAT FITS

Introduced Pests, on Purpose
MELALEUCA THREATENED IN FLORIDA

Two of six new species of insects are candidates for biological control of paperbark, a large tree that has become the most troublesome terrestrial weed in the United States. Introduced into Florida in 1906 from Australia as an ornamental, paperbark (*Melaleuca quinquenervia)* now invades over 500,000 acres and causes extensive environmental and economic damage. Conventional control measures, like cutting, burning and herbicides, are costly, ineffective and environmentally inappropriate in managing this pest. ARS scientists have for the first time identified several gall midges (*Lasioptera and Lophodiplosis*) that are native to Australia that may suppress the growth of this tree. Several have been identified as being potential biocontrols because they are highly specific in attacking paperbark buds and leaves and in keeping it under control. Six of these insects are species new to science and are named and described in detail. Researchers trying to find natural control for this tree pest will now be able to readily identify and distinguish among these exotic insect species. Biocontrol specialists can now begin research to introduce them into Florida.

BEESWAX THE CLUE!

A speck of beeswax has authenticated one of the most powerful symbols of a united Europe – the Iron Crown of Charlemagne. The finding is a triumph for the Australian Nuclear Science and Technology Organization (ANSTO) at Lucas Heights.

Charlemagne was born in 742 and became king of the Franks, eventually uniting most of Western Europe under his rule. The most important figure of the Middle Ages, he dragged Europe from the anarchy of the Dark Ages, reviving commercial, cultural and political life. On Christmas Day, 800, he was crowned the first Holy Roman Emperor by Pope Leo III in Rome. The existence of his famous crown, however, has been documented only back to the 1530s.

Made of iron, gold, precious stones and, reputedly, a nail from the cross of Christ, it was believed to contain no organic matter, which is essential for carbon-dating.

But with its modern home, the Cathedral at Monza, near Milan, preparing to celebrate its 14th centennial, scientists had another close look at the crown several months ago and realized that its precious stones were held in place by a glue that contained beeswax.

They sent their samples to ANSTO to date the making of the crown to between 700 and 780 far older than believed and very probably during Charlemagne's lifetime.

Daniel Lewis, from Australasian Beekeeper

Free Booklet
PLANT TREES THIS YEAR

A free booklet is available from The National Arbor Day Foundation to assist in planning tree planting.

Called Conservation Trees For Your Farm, Family & Future, the booklet uses colorful photos and illustrations and easy-to-understand descriptions to guide tree planting and care.

"This booklet is part of a multi-organization effort to help farmers and ranchers and beekeepers make trees an integral part of sustainable agriculture," John Rosenow, The National Arbor Day Foundation's president, said.

Conservation Trees For Your Farm, Family & Future is a cooperative program of The National Arbor Day Foundation, the National Association of Conservation Districts, the National Association of State Foresters, and the United States Department of Agriculture: Agriculture Research Service, Consolidated Farm Service Agency, Extension Service, Forest Service, and Natural Resource Conservation Service.

For free booklet, send your name and address to: Conservation Trees, The National Arbor Day Foundation, Nebraska City, NE 68410.

EAS APITHERAPY

From all around the world, people are developing a healthy respect for honey bees. Thousands are discovering the healing power of honey, propolis, bee pollen, royal jelly and bee venom as an alternative to other traditional methods. This alternative is known as Apitherapy and it is causing many to question why these products are not being used on a grander scale.

As part of a week long series of educational seminars for beekeepers, sponsored by the Eastern Apicultural Society (EAS), the Apitherapy seminar occurs August 13 from 8:00 a.m. till 12:00 p.m. on the University of Delaware campus.

The seminar will feature Jim Higgins, Master Beekeeper and Apitherapist, along with Pat Wagner, author and MS patient. Jim will reveal the many uses and benefits of the products from the hive, while Pat will discuss and demonstrate the amazing qualities of Bee Venom as her alternative in fighting Multiple Sclerosis.

Learn how these age-old natural remedies can be a key in relieving chronic pain and symptoms from Arthritis and Multiple Sclerosis, to asthma, cancer and other auto-immune diseases.

For more information, contact Walter Blohm, 718-380-0829.

SHEPPARD GETS DONATION

Dr. Steve Sheppard, Univ. WA, Pullman, and holder of the Roy Thurber Chair of Apiculture is setting up an apiary to do research and apiculture Extension.

In need of 200 colonies he asked for donations and received 100 colonies from a commercial beekeeper.

The Inland Empire Beekeeping Association has volunteered to pay for up to 70 packages to fill the empty equipment already at the University. This with the live hives still at the University Apiary will bring his count up to the desired number.

HONEY BOARD NEWS

NEW MEMBERS – Agriculture Secretary Dan Glickman has appointed 12 members to the National Honey Nominations Committee, which nominates individuals for appointment to the Honey Board.

Newly appointed members are: Troy Howard Fore Jr., Jesup, GA; Elaine Edith Miller, Duson, LA; Oren Dennie Best, Sunfield, MI; Wilbur Allen Tuttle, Vandalia, OH; William Davis Lane, Memphis, TN; and Leland Ray Heine, Hustisford, WI.

Reappointed members are: Jerry Alan Brown, Haddam, KS; Glenn Ewing Davis, Blue Springs, MO; Todd Duane Larson, Billings, MT; Joann Manes Olstrom, Reedsport, OR; Glen Ray Wollman, Parker, SD and Charles Dane Hannum, Arlington, VA.

All members will serve terms that begin immediately and end December 31, 1999.

Four alternate members to serve on the Honey Board were also named.

The following appointees will serve a term beginning April 1, 1997 and ending March 31, 2000.

Producers representing Region 5: Sharon A. Gibbons, Ballwin, MO, member; and George C. Walker, III, Temple, TX, alternate.

Producers representing Reg. 7: Stephen Conlon, New Martinsville, WV, reappointed to the member position and Linda Hackenburg, Lewisburg, PA, alternate.

Appointees representing importers/exporters: John McGinnis, exporter, New Smyrna Beach, FL, reappointed to a member position; and Robert H. Coyle, importer, Clyde Hill, WA, reappointed to an alternate position.

Appointees representing cooperative members: Albert B. Belliston, Heyburn, ID, reappointed to the member position; and David B. Allibone, , Sioux City, IA, reappointed to the alternate position.

The Honey Board administers an industry-funded, national research, promotion and consumer information program to increase U.S. honey consumption and exports. USDA's Agricultural Marketing Service monitors the program.

NEW SALES DATA DOWN, UP – Nielsen reports honey retail sales for the 52-week period ending December 21, 1996, were down 5.4 percent in pounds and up 18.6 percent in dollars. The average price per pound for honey during this period was $2.35. The data is based on grocery stores with sales of over $2 million. In other market trends, the NHB continues to watch the packer tracking study conducted by Research Dimensions that uses data from 15 honey packers (who represent about 50 percent of all honey sold in the U.S.). That study reported total year-to-date honey sales through December 1996 were down 8.4 percent.

Meanwhile, for the 52-week period ending on January 18, retail honey sales were down 5.3 percent (in pounds) and up 18 percent (in dollars). The average price per pound for honey during that same period was $2.22. In packer news, Research Dimensions (the firm contracted by the Honey Board to track packer honey sales) reported that January total honey sales were up 7.35 percent. Retail sales were down 7.33 percent, foodservie sales were up 20.35 percent and bulk sales were up 20.78 percent. Research Dimensions' data is based on sales by 15 honey packers who represent about 50 percent of all honey sold. On the export front, the U.S. Department of Commerce Census Bureau reports that U.S. honey exports between January and November 1996 were 4,672 metric tons, up 23 percent from the same period 1995.

NEW HONEY BOARD COOKBOOK – The National Honey Board's new low-fat cookbook "Sweetened Naturally with Honey" is available for purchase.

The cookbook contains over 100 delectable honey recipes plus full-color, mouthwatering photographs throughout! The cookbook was sold at supermarket checkout stands throughout the country in January. You can sweeten your honey sales with this cookbook now available from the National Honey Board. To order a single copy of the cookbook, send a check or money order for $2.95 to: National Honey Board - Dept. BK, P.O. Box 125, Wisconsin Rapids, WI 54495.

For orders of 10-49 cookbooks, the cost is $2.65 each. For orders of 50-119 cookbooks, the cost is $2.25 each. For 120 or more cookbooks, the cost is $1.75 each. If you wish to purchase "Sweetened Naturally with Honey" in large quantities, please telephone the National Honey Board office to order using Visa or Mastercard, or send a check or money order to: National Honey Board, Cookbook, 390 Lashley St., Longmont, CO 80501-6045. Colorado residents, please include 3% sales tax. Please allow 6-10 weeks for delivery.

NEW DIRECTORY – Wouldn't it be great to get information about your company and its products/services into the hands of food manufacturers, foodservice industry distributors and international traders? Wouldn't it be even better if this goal could be realized with very little effort and no expense on your part? This will soon be a reality for those who opt for listing in the National Honey Board's 1997 update to its *Honey Suppliers Directory.*

The bulk of the book will be company listings giving considerable detail about the products (different types, sizes and forms of honey) and services (will export) available to potential buyers. Listings in the book will be alphabetical by company name; it also will include a state-by-state index listing company names and page number location. General/introductory information will be included: a description of the Honey Board, the Honey Hotline number, descriptions of the different forms of honey and conversion factors.

The Honey Suppliers Directory will be distributed at both domestic and international trade shows in which the Honey Board participates as well as in fulfillment of requests the Honey Board receives weekly via phone calls, faxes and letters.

Listing in the *Honey Suppliers Directory* is limited to honey handlers (producer-packers, packers and importers) who have reported to the National Honey Board their honey purchasing or packing activity for 1996. Handlers who wish to be listed in the directory should be capable of fulfilling high-volume orders.

CALENDAR

♦ CALIFORNIA ♦

The Sacramento Area Beekeepers Assn. offers two beekeeping workshops. The instructor for Beginning Beekeeping is Randy Oliver, a commercial beekeeper and queen producer. Beginning Beekeeping is a one-day workshop, Saturday April 12, 8:00 a.m. to 4:30 p.m. at the Sacramento County Cooperative Agricultural Extension Auditorium, 4145 Branch Center Road, Sacramento, CA. The cost is $25 per person or $40 for a family of two or more (parents and children).

The Intermediate Beekeeping instructor is Dr. Eric Mussen, the Extension Apiculturist at the Univ. of CA at Davis. The Intermediate workshop is one day, Saturday, April 19, 8:00 a.m. to 4:45 p.m. at the Sacramento County Cooperative Agricultural Extension Auditorium, 4145 Branch Center Road, Sacramento, CA. The cost is $25 per person or $40 for a family of two or more (parents and children).

Class size is limited. For information call Pam or Nancy at 916-451-2337, Tuesday through Saturday 10 a.m. - 4 p.m.

♦ INDIANA ♦

The Indiana State Beekeepers Association will meet Saturday, April 5, at the Stewart Center, Rm 214, Purdue University, West Lafayette, IN from 8:30 - 3:00.

Speakers include Dr. Keith Delaplane, Dr. Greg Hunt, Dr. Medhat Nasr, Kathleen Prough, Jim Mast and Dr. John Skinner. Call Dave Laney 219-656-8701, or Greg Hunt 317-494-4605 for more information.

♦ MAINE ♦

The Maine State Beekeepers Association will hold the 1997 Annual Meeting on Saturday, April 5, 1997 at Governor's Restaurant located at Howard Johnson's in Waterville, ME. The meeting will feature Kim Flottum, Editor, *Bee Culture* Magazine who will give two presentations on current topics in apiculture and Dr. Frank Drummond, University of Maine who will speak about his work on blueberry pollination utilizing solitary bees.

Governor's is easily accessible at exit 34 off of I-95. For information contact: William Truesdell, Secretary, MSBA, RR2, Box 26, Bath, ME 04350 (207) 443-1498.

♦ MICHIGAN ♦

Southeastern MI Beekeepers Assn., in cooperation with the Schoolcraft College Beekeepers Club and the Cranbrook Beekeepers Club, will hold its 59th Annual Bee School Saturday, April 19, from 8:00 a.m. to 4:00 p.m., in the Waterman Center Building at Schoolcraft College, 18600 Haggerty Road, Livonia, MI. Speakers are Larry Connor and Roger Hoopingarner.

A registration fee is charged at-the-door for all non-members.

For information, Roger Sutherland (313) 668-8568 or Joe Peczynski (313) 464-4517.

♦ OHIO ♦

The Ohio State Beekeepers' Association will hold their Summer meeting on June 20, 21, at Salem, OH near Youngstown. Beeyond The Basics class will be Friday night. For information contact Dana Stahlman, (614) 855-1656.

Instrumental Insemination and Honey Bee Breeding Short Course. An intensive three-day course on the technique of instrumental insemination and bee breeding will be offered at the Ohio State University Rothenbuhler Honey Bee Research Laboratory in Columbus, Ohio. The course is scheduled for Wednesday through, Friday June 18 - 20. The class is designed for commercial beekeepers who are involved in a breeding program or who want to improve upon an existing program. It is also designed for laboratory personnel requiring the skill for research purposes.

Classes are taught by Susan Cobey, who has extensive experience in the technique and has published numerous articles in beekeeping literature on related topics.

Knowledge of queen rearing experience is required. Beekeepers must provide their own insemination equipment. Microscopes can be provided upon request.

Registration is $300. Lodging, meals and transportation are not included. Deadline for registration is May 1.

For information contact: Susan Cobey, 1735 Neil Ave., Columbus, OH 43210 (614) 292-7928 or FAX (614) 292-2180.

♦ PENNSYLVANIA ♦

Bucks and Montgomery Counties will be hosting their annual joint bee meeting, Saturday, June 21 at 1:30 p.m.

The meeting will be held on the Delaware Valley College campus about one mile south of Doylestown, PA. For further information contact Dr. Bob Berthold, Delaware Valley College, Doylestown, PA 18901, phone (215) 489-2285.

The Capital Area Beekeepers Association will hold its tenth annual short course in basic beekeeping on May 10, 1997 from 8:00 a.m. to 4:30 p.m. at the Dauphin County Agriculture and Natural Resources Center in Dauphin, PA.

Speakers include Jim Aucker, Maryann Frazier, Jim Steinhauer, Jennifer Finley.

Pre-registration is requested before May 7, course fee is $25. Bring a veil and suit. For additional information and a registration form contact Maria Contino, Secretary, 6087 Rockland Drive, Harrisburg, PA 17112, or call 717-657-3932.

Holistic Healing With Honey Bees - For the first time in the U.S., a four-day, in-depth course on healing properties of the beehive (Apitherapy). Developed by the American Apitherapy Society (AAS), this 40 hour course is based on extensive clinical experience and the massive database of libraries belonging to the AAS. A group of selected experts, from Physicians to lay practitioners, alternative health specialists and beekeepers will gather in Millerton, PA from July 2nd through July 5th, on the Draper Apiary Farm.

Designed to give comprehensive understanding of Apitherapy, the course covers clinical applications of all hive products, including Bee Venom, Royal Jelly, Bee Pollen and Propolis. With demonstrations, practice periods, workshops, lectures and a visit to a beeyard, this four-day course includes an instruction book, lunch every day, dinner on the first three days and Certificate of Completion for $325.

For information contact Louise Estupinian, 415-454-0692, FAX: 415-927-1128; e-mail: 102450.325@compuserve.co.

♦ TENNESSEE ♦

The Beekeepers of Tennessee will hold their 1997 Annual Convention at the Clyde M. York 4-H Center, Route 13, Pomona Road, Crossville, TN from Friday, May 9, 1997 through Sunday, May 11.

Friday's sessions will be devoted to the TN Bee Masters program conducted by Dr. John Skinner, State Apiculturist. The convention convenes on Saturday with guest speakers Dr. Medhat Nasr, Ontario, Canada, and experts from the fields of beekeeping, bee pollination and bee moving.

Registration will be $15 for members, $25 for non-members. Reservations are required no later than April 25. Meals and overnight accommodations are available at reasonable rates at the Camp. Special rates for families with children.

For information please contact Edward B. Riggs, P.O. Box 33, Harriman, TN 37748-0033 or Ph (423) 882-2280, Fax (423) 882=5430, E-mail eriggs@usit.net.

♦ WEST VIRGINIA ♦

West Virginia Beekeepers Spring Meeting, Saturday, May 10, Parsons, WV. The morning sessions will feature a slide presentation on local honey plants closing with a luncheon. The afternoon program will include two field trips one to the state apiary in Tucker County and one to Mountain State Co. honey packing facility.

For information call John Campbell at 304-478-36-75 after 6:00 p.m.

Smokey Dents

After the first season, Smokey thought he'd better rethink his new 'Comb Honey Simplified' technique . . .

1997 WHO'S WHO

ASSN. CONTACT	INSPECTION	EXTENSION	UNIV. CONTACT	GOV. TRADE OFFICE	DEPT. OF AGR.
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•**Apimondia.** International Federation of Beekeepers' Associations — President, Raymond Borneck, Rue Du Creux, Montbarrey, France, 3y; General Secretary, 101 Corso Vittorio Emanuele Rome, Italy 00186, (6) 65-12286. Periodical: Apiacta (quarterly).

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•**American Beekeeping Federation.** Sec.-Treas., Troy Fore, P.O. Box 1038, Jesup, GA 31545 (912) 427-8447

•**American Honey Producers Association.** Jerry Stroope, Rt. 3, Box 258, Alvin, TX 77511. Ph. (713) 996-1523, FAX (713) 996-9484.

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- **CTL MD BEEKEEPERS**—Richard Greaves, 14 Murray Hill Circle, Baltimore, 21212
- **HAGERSTOWN VAL APIAN SOC** — Dick Roberts, 15 Hebb Rd., Hagerstown, 21740
- **MONTGOMERY CO BKPRS** — George W. Imire, Jr. 12705 Circle Dr., Rockville, 20850
- **SUSQUEHANNA BKPRS** — Eric Nickerson, 1711 Chateau Court, Fallston, 21047

MAINE

- **CENTRAL MAINE BK ASSN**— Ed Branagan, RFD 1, Box 2620, E. Corinth 04427
- **SAGADAHOC CO BKPRS ASSN** — Ron Riendeau, 9 North Street, Topsham, 04086
- **SEACOAST BKPRS ASSN** — J. Hadwen, 263 Diamond Hill Rd., Berwick, 03901
- **TRI-COUNTY BKPRS** — Genevieve Delicata, RR 1, Box 417, Stockton Springs 04981
- **WESTERN ME BK ASSN** — Bruce Clark, RR 1, Box 1600, New Vineyard, 04956

MASSACHUSETTS

- **BARNSTABLE CO BEEKEEPERS**—Claire Desilets, P.O. Box 836, E. Sandwich, 02537
- **BRISTOL CO BKPRS** — Frederic Magee, 148 Turnpike St., West Bridgewater, 02379
- **ESSEX CO BEEKEEPERS ASSN** — Jane Wild, P.O. Box 10, Topsfield, 01983
- **HAMPDEN CO BKPRS** — Susan Godard, 592 Sylvester Rd., N. Hampton, 01060
- **HAMPSHIRE CO BKPRS**—Loraine Neveu, 342 Amherst St., Granby, MA 01033-9720
- **MIDDLESEX CO BKPRS**—Ted Shylovsky, 192 Boston Post Rd., Sudbury, 01776-3102
- **NORFOLK CO BKPRS** — Sharon Courchesne, 230 Park St., Attleboro, 02703-3114
- **NORTHERN BERKSHIRE BKPRS**—David Thayer, 720 Middle St., Clarksburg, 01247
- **PLYMOUTH CO BKPRS**—Frederic Magee, 148 Turnpike St., West Bridgewater, 02379
- **WORCHESTER CO BEEKEEPERS**—Jania Antos, 124 Dudley So. Bridge, Dudley, 01571

MICHIGAN

- **CRANBROOK BEE CLUB** — Larry or Sue Yates, 705 Collidge, Birmingham, 48101
- **HOLLAND AREA BKPRS** — Paul Fredrickson, 1103 W. 32nd S., Holland, 49423
- **JACKSON CO BKPR ASSN** — Kenneth Losey, 6962 Folks Rd., Horton, 49246
- **SAGINAW BAY BEEKEEPERS** — John Kern 12740 E. Curtis, Frankenmuth, 48072
- **SOUTHEASTERN MI BEE ASSOC** — Ann Kerwin, 17516 Birchcrest, Detroit 48221
- **SOUTHWEST MI BEEKEEPERS** — Don Hiatt, 123 Drum, Miles, 49120
- **SUPERIOR BEEKEEPERS ASSN**—Derek Bush, 7827 S. Forrest, Brimley, 49715

MINNESOTA

- **CENTRAL MN BEEKEEPERS ASSN** — Rt. 1, Box 45, Ponsford, 56575
- **LAKES REGION BEEKEEPERS,** —Russell Hofman, Richville 56576
- **MN HOBBY BKPRS ASSOC** — Gary Snydock, 6572 N. Stillwater Blvd., Oakdale, 55128
- **MN HONEY PRODUCERS** — Fred Holte, R1 43480 Andee, Harris, 55032
- **NO CENTRAL BEEKEEPERS ASSN**—P.O. Box 294, Brainerd, 56401

MISSISSIPPI

- **CENTRAL MS BKPRS ASSN** — Del Sparks, 173 Plummer Circle, Jackson, 39212
- **GULF COAST BKPRS ASSN** — D. Kilbern, 2910 Duncan Ave., Pascagoula, 39581
- **MS DELTA BKPRS ASSN** — Huburt Tubbs, P.O. Box 3, Webb, 38966
- **SOUTHEAST MS BKPRS ASSN** — Don Rushton, 37 Northeast, Laurel, 39440

MISSOURI

- **BOONE REGIONAL BKPRS** — Arlon Gelder, 6800 Kircher Rd., Columbia, 65202
- **DALLAS CO BEEKEEPERS** — Inge Foster, Rt. 1, Box 105, Urbana, 65767
- **EASTERN MO BKPR ASSN** — Ken Corbin, 1776 Golden Lake Ct., Chesterfield, 63017
- **JEFFERSON CO BKPRS** — Bob Graham, 9727 Morse Mill Rd., Dittmore, 63023-2717
- **MID-MO BEEKEEPERS** — David James, Rt.1, Jadwin, 65501
- **MIDWESTERN BKPR ASSN** — Ed Fisher, 4005 NE 132nd St., Smithville 64089
- **MISSOURI VALLEY BKPRS** — Gordon Davis, 2151 Golfview, Wentzville, 63385
- **OZARK BKPRS ASSOC** — Mary Jane Kelly, 5938 W. Farm Rd. 94, Springfield, 65803
- **OZARK MTN BKPRS** — Eddie Rosencrans, 212 Newbury Rd., Reeds Spring, 65737
- **SEMO HONEY PRODUCERS** — Ray Batton, 3032 N. 14th, Poplar Bluff, 63901
- **SO CENT BEEKEEPERS** — Marge Kilton, RR 2, Box 2746, Alton, 65606
- **SW MO BEE ASSOC** — Marilyn Spencer, Rt.1, Box 254-A, Rocky Comfort, 64861
- **TWO RIVERS BKPRS ASSN** — Gerry Lee, 9637 Ridge Ave., Overland, 63114
- **WEBSTER CO BKPRS ASSN** — Keith Nutting, Rt.1, Box 588, Fair Grove, 65648

MONTANA

- **EASTERN MT BEEKEEPERS** — Gorvan Leduc, 2026 Wilkins Rd., Laurel, 59044

NEBRASKA

- **EASTERN NE HONEY PROD** — John Rudebusch, RR 1, Box 41, Randolph, 68771
- **NE BKPRS ASSN** — Jerry D. Bishop, 311 W. 28th Avenue, Bellevue, 68005-5323

NEW HAMPSHIRE

- **KEARSARGE BEE ASSN** — Paula Morse, RR 1, Box 376, Bradford 03221-9123
- **MERRIMACK VLY BEEKEEPERS** — Robert Salvage, 3 Birchwood Rd., Windham, 03087
- **PAWTUCKAWAY BKPRS** — Guy Senneville, 177 Smyth Rd., Manchester, 03104

NEW JERSEY

- **CENTRAL JERSEY BKPRS** — Jim Puvel, 2 Smylie Rd., Wrightstown, 08562-9727
- **ESSEX CO BKPRS** — Marian E. Chandler, 85 Deerfield Rd., W. Caldwell, 07006
- **MORRIS CO BEEKEEPERS** — Roha Duve, R.D. 1, Box 258-B, Washington, 07862
- **NE BKPRS ASSOC, NJ** — Alfred Cundall, 390 Jackson Ave., Township of Wash, 07675
- **NW JERSEY BKPRS. ASSN.** — Gary L. Bradshaw, 32 Hewitt Rd., Stockton, 08559
- **SOUTH JERSEY BKPRS** — Patricia C. Schuler, P.O. Box 228, Richland 08350
- **SUSSEX CO BKPRS SOC** — Marilyn Cosh, 175 Sally Harden Rd., Wantago, 07461

NEW YORK

- **CHAMPLAIN VAL BKPRS** — L. Surprenant, Box 300A Co Home Rd, Essex, 12936
- **CHAUTAUQUA CO BKPRS** — R. Dahlgren, 2902 Stone Rd., Falconer, 14733-7932
- **EMPIRE ST. HONEY PRODUCERS** — Judith Doan, 1263 Redman Rd., Hamlin, 14464
- **FINGERLAKES BK ASSN** — Richard Taylor, Box 352, Interlaken 14847
- **LONG ISLAND BKPRS** — Richard Blohm, 30 Cherry Lane, Huntington, 11743-2945
- **SE BKPRS CLUB** — Kathleen Smith, 239 Wisner Ave., Middletown, 10940
- **SOUTHERN TIER BKPRS** — Hervey W. Heywood, 2804 Ellis Creek Rd., Barton, 13734
- **WESTERN NY HONEY PRODUCERS** — Robert Y. Harbison, 2493 Sweet Home Rd., Amherst, 14228

NORTH CAROLINA

- **ALAMANCE CO BKPRS** — D Moore, 3634 Stoney Crk Church Rd., Elon College, 27244
- **ANSON CO BKPRS ASSN** — Harvey Tucker, 201 Moores Lake Rd., Wadesboro, 28170
- **BUNCOMBE CO BEEKEEPERS** — Sally Ellis, 345 Rockhouse Rd., Marion 28752
- **BURKE CO BKPRS ASSN** — N. Christine Beck, Rt. 10, Box 576, Morganton, 28655
- **CARBBARRUS CO BKPRS ASSN** — Charles Griffin, 5175 HW 6011 S., Concord 28025
- **CAROLINA COASTAL BKPRS.** — Albert Phelps, 167 Stonewall Jackson Rd., Wilmington, 28412
- **CATAWBA VALLEY BEEKEEPERS** — Bobby Glenn, 303 Travis Dr., Newton, 28658
- **CHATHAM CO BKPR ASSN** — Richard Bradley, P.O. Box 1172, Pittsboro, 27312
- **COASTAL PLAIN BKPRS ASSN** — Claiborne Holtzman, 117 Hubbard Lane, Rocky Mount, 27801
- **CRAVIN-PAMLICO BKPRS.** — Fred Hugh, Sr., 5320 Trenwoods Dr., New Berlin, 28562
- **CUMBERLAND CO BKPRS ASSN** — Marvin Carlsen, 2616 Wingate Rd., Fayetteville, 28306
- **DAVIDSON CO BKPRS ASSN** — Colen Smith, 228 Bowers Rd., Lexington, 27292
- **DAVIE CO BKPRS ASSN** — William Phelps, 666 Pine Ridge Rd., Mocksville, 27028
- **FORSYTH CO BKPRS ASSN** — M. Weatherman, 5395 Spainhour Mill Rd., Tobaccoville, 27050
- **GASTON CO BKPRS ASSN** — John Hayes, 222 Lakeview Dr., Belmont, 28012
- **GREENSBORO BEEKEEPERS** — Duane Bryant, 1904 Dowing St., Greensboro, 27410
- **GUILFORD CO BKPRS** — John Godfrey, 6304 Sable Lane, Greensboro, 27406
- **HENDERSON CO BKPR** — Lynn Hinkle, P.O. Box 417, Hendersonville, 28793
- **IREDELL CO BKPRS** — Bobby Davidson, 419 Cooper Farm Rd., Statesville, 28677
- **JACKSON CO BKPRS ASSN** — Fred Harris, Box 154, Cullowhee, 28723
- **JOHNSTON CO BKPRS ASSN** — Lloyd Reynolds, 2283 Wilson Mills Rd., Smithfield, 27577
- **LEE CO BKPRS ASSOC** — G.W. Godfrey, 1926 S. Plank Rd., Sanford, 27330
- **LINCOLN CO BKPRS ASSN** — David Noles, P.O. Box 186, Lincolnton, 28092
- **MACKLENBURG CO BKPRS** — James Reep, 4600 Riverdale Dr., Charlotte, 28273
- **MACON CO BKPRS ASSN** — John Henry, 75 Gregory Rd., Franklin 28734
- **MOORE CO BKPRS ASSN** — Tanya Enlow, 548 Pinebluff Lake Rd., Aberdeen, 28315
- **ORANGE CO BKPRS ASSOC** — Kenneth Medlin, 7517 S. Forty Rd., Bahama, 27503
- **PERSON CO. BKPRS. ASSN.** — Ed Johnson, 2039 Thee Hester Rd., Roxboro, 27573
- **RANDOLPH CO BKPRS** — George Byrum, 3661 Old Lexington Rd., Asheboro, 27203
- **RICHMOND CO BKPRS ASSN** — Sam Yates, 299 Rosalyn Rd., Rockingham, 28379
- **ROBESON CO BKPR ASSN** — M. Brewington, P.O. Box 2168, Pembroke, 28372
- **ROCKINGHAM CO BKPRS ASSN** — Fred Small, 2306 Fernwood Dr., Greensboro, 27408
- **ROWAN CO BEEKEEPERS ASSN** — Pam Deal, 1025 Lamb Rd., Lexington, 27295
- **STANLEY CO BKPRS ASSN** — Billy Smith, 20553-A Hwy 52 S. Albermarle, 28001
- **SURRY CO BKPRS ASSN** — Cecil Gilley, 108 Knobb Hill Lane, Pilot Mountain, 27041
- **TRANSYLVANIA CO BKPR** — Rick Queen, 305 Davidson River Rd., Pisgah Forest, 28768
- **WAKE CO BKPR ASSN** — J.D. Foust, 609 Lakestone Dr., Raleigh, 27609
- **WATAUGA CO BKPRS** — Joe Howser, 117 Highland Park Lane, Boone, 28607
- **WAYNE CO BKPRS ASSN** — Jimmy Ray Mitchell, 2133 Dobbersville Rd., Mt. Olive, 28365
- **WILSON CO BEEKEEPERS ASSN** — Harvey Denton, Rt. 2, Box 50-B, Bailey, 27087

OHIO

- **ASHTABULA BEEKEEPERS** — Bill Loudon, 86 Stockwell St., Painesville, 44077
- **BUTLER CO BEEKEEPERS** — Alex Zomchek, 14 Carrie Circle, Oxford, 45056
- **CAMBRIDGE-NOBEL BK ASSN** — Roger Seaton, 9488 Liberty Rd., Cambridge 43725-9023
- **CARROLL CO BKPRS** — Jack Leggett, 7190 Roswell Rd., Sherrodsville, 44675
- **CENTRAL OH BKPRS** — David Casdorph, 4111 Maize Rd., Columbus, 43224
- **CLARK CO BKPRS** — Rolland Anderson, 1312 N Lowry Ave, Springfield, 45504
- **COLUMBIANA & MAHONING CO BKPR** — Doug Yukich, 11251 Mahoning Ave., NE, Alliance, 44601-9210
- **COLUMBIANA CO BEEKEEPERS** — Grace Hamilton, Rt. 1, Lisbon, 44432
- **CUYAHOGA COUNTY BEE ASSN** — William Conley, 292 Fowles Rd., Berea, 44017
- **EAST CENTRAL BKPRS** — Ralph McLeod, 1st Main St., Kirkerville, 43033
- **GEAUGA BEEKEEPERS ASSN** — Mary Cluts, 9799 Pekin Rd., Novelty, 44072
- **GREENE CO BEEKEEPERS** — O. K. Simison, Rt. 1, Spring Valley, 45370
- **HIGHLAND CO BEEKEEPERS** — Jim Higgins, 3801 U.S. 50, Hillsboro 45133
- **HOCKING CO BKPRS** — Annette McClain, 20193 St. Rt. 328, New Plymouth, 45654
- **JEFFERSON CO BEEKEEPERS** — Susan Kovaleski, 167 Rosslyn Blvd., Steubenville, 43952
- **KOKOSING VALLEY BEEKEEPERS** — Gertrude Rasor, 500 North Ridge Hts., Dr., Howard, 43028
- **LAKE CO BKPRS ASSN** — Mark Rinderman, 116 Hawthorne Dr., Painesville, 44077
- **LAWRENCE CO BKPRS** — Margaret Reid, 15754 St. Rt. 775, Willow Wood, 45696
- **LORAIN CO BKPRS ASSN** — Jean McAudy, 2420 Brownhelm Sta. Rd., Vermilion 44089
- **MARION CO BKPR ASSN** — Henry Perry, 440 Avondale Ave., Marion 43302
- **MAUMEE VALLEY BKPRS** — Robert D. Smith, 238 E. 5th St., Perrysburg, 43551
- **MEDINA CO BEEKEEPERS** — Kim Flottum, 7011 Spieth Rd., Medina 44256
- **MIAMI CO BEEKEEPERS** — Robert Newmann, 183 S. Dorsett Rd., Troy, 45373
- **MORROW CO AREA BKPRS** — Arthur Korody, 4084 Co. Rd. 115, Mt. Gilead, 43338
- **MUSKINGUM CO BKPRS** — Dennis Moffitt, 185 Homestead Dr., New Concord, 43762
- **NW OH BKPRS** — Zelma Cox, 1623 W. Wayne, Lima 45805
- **PORTAGE CO BEEKEEPERS** — Peggy Kaminski, 1459 E. Howe Rd., Kent, 44240
- **RICHLAND CO BEEKEEPERS** — Ralph Mitchell, Brokaw Rd., Rt. 2, Butler, 44822
- **ROSS CO BEEKEEPERS ASSN** — Fred Weaver, 27 Courtland Dr., Chillicothe, 45601
- **SOUTH CENT. BK ASSN** — Fred Ginther, 570 Liberty Hill Rd., Chillicothe, 45601-9275
- **SOUTHWESTERN OH BEE ASSN** — Karen Berry, 5186 Batavia Rd., Cincinnati, 45244
- **STARK CO BEEKEEPERS** — Mrs. Fran Muller, 1927 6th St. SW, Canton 44706
- **SUMMIT CO BKPRS** — Cheryl Beyer, 6423 Olde Eight Rd., Peninsula, 44264
- **TRI-COUNTY BEEKEEPERS ASSN** — B.J. Hoffman, 3198 Crafter Rd., Wooster, 44691
- **TRUMBULL CO BEEKEEPERS** — Sheila Terrill, 10044 Ridge Rd., Kinsman, 44428
- **WARREN CO BEEKEEPERS** — Oscar Brown, 7154 Hopkins Rd., Maineville, 45039

OKLAHOMA

- **CENTRAL BEEKEEPERS ASSN** — Glenn Gibson, Box 368, Minco, 37059
- **CENTRAL OK BKPRS** — Robert Wagner, 2928 S. Oak Dr., Midwest City 73130
- **DEEP FORK VALLEY BKPR ASSN** — J.H. Allison, Rt. 1, Box 386 B, Henrietta, 74437
- **EAST CENTRAL BEEKEEPERS ASSN** — Betty Allred, Rt. 7, Box 248, Ada 74820
- **FRONTIER COUNTRY BKPRS ASSN** — Chuddie Smith, P.O. Box 34, Guthrie, 73044
- **GREEN COUNTRY BKPR** — Shirley Wright, Rt. 1, Box 55A7, Locust Grove, 74352
- **NORTH CENTRAL BEEKEEPERS** — Joe Green, Box 1983, Stillwater, 74076
- **NE OKLAHOMA BEEKEEPERS** — Dr. James R. Sipes, 7760 E. 24th St., Tulsa, 74129-2402
- **NW BEEKEEPERS ASSN** — Leonard Morris, 905 E. State, Fairview, 73737
- **SW OK BEEKEEPERS ASSN** — Eva Bell Ritter, HC 64, Box 57, Marlow, 73055
- **WESTERN AR/ESTRN OK BK ASSN** — Danny Self, Rt. 1, Box 1325, Arkoma 74901

OREGON

- **CENTRAL OREGON BKPRS** — Bob Morgan, 3800 Benson Rd., The Dalles, 97058
- **COOS CO** — Steve McGuire, 541-396-3318
- **EASTERN OR BKPRS** — Dave Lefore, Rt. 3, Box 207E, Milton-Freewater, 97862
- **KLAMATH COUNTY** — Ken Crow, 541-882-1893
- **LANE CO BEEKEEPERS** — Lee Ziegler, 541-688-5675
- **METROPOLITAN AREA BKPRS** — Chuck Sowers, 4390 Lords Lane, Lake Oswego, 97304
- **PORTLAND** — Jim Allison, 503-663-1058
- **SOUTH COAST BKPRS ASSN** — Joann Olstrom, 6134 Maple Court, Reedsport, 97467
- **SOUTHERN OR** — Stann Kee, 541-664-3238
- **TILLAMOOK COUNTY** — Bob Allen, 541-322-3819
- **TUALATIN VALLEY** — Chuck Sowers, 503-636-3127
- **WILLAMETTE VALLEY** — Walt Nichol, 503-585-5705

PENNSLYVANIA

- **2 C'S & A BEE ASSOC** — Carol Z. Smith, 2915 15th St., Altoona, 16601
- **ADAMS CO BKPRS** — John Creighton, 1431 Goodyear Rd., Gardners, 17324
- **ALLEGHENY MTN. BKPRS. ASSN.** — Melvin Fisher, RR 5, Box 126, Meyersdale, 15552
- **ARMSTRONG-INDIANA BKPR** — Charlie Lyon, 207 Fairground Rd., Ford City, 16226
- **BEAVER VALLEY AREA BKPRS** — Gary Debarry, 5562 Hobart St., #503, Pittsburgh, 15217
- **BERKS CO BKPRS** — Kent Riegel, 2930 Bellemans Church Rd., Mohrsville, 19541
- **BUCKS CO BEE ASSN** — Josef Ridgway, 2728 Red Gate Drive, Doylestown, 18901

- **CAPITAL AREA BK ASSN** — Maria Contino, 6087 Rockland Dr., Harrisburg, 17112
- **CENTRAL COUNTIES BKPRS ASSN** — Valerie Lintner, Box 61 A Star Route, Huntingdon, 16652
- **CENTRAL WSTRN PA BEE ASSN** — Nancy Paffenroth, Unionville Rd., Evans City, 16033
- **CENTRE CO. BKPRS. ASSOC.** — Felix Shuey, 1403 Benner Pike, Bellefonte, 16823
- **CHESTER COUNTY BK ASSN** — Richard Huey, Box 553, Valley Forge, 19481
- **CLARION CO BEEKEEPER ASSN** — R. W. McHenry, Front St., Box 176, Sligo, 16255
- **FRANKLIN CO BKPR** — Lloyd Benedict, 2183 Anthony Hwy., Chambersburg, 17201
- **LACKAWANNA CO BEEKEEPERS** — Esther Ziegler, Rt. 1, Dalton, 18414
- **LANCASTER CO HONEY PRODUCERS** — Loren Sadler, 1235 Red Run Rd., Stevens, 17578
- **LEHIGH VALLEY BKPRS** — Richard Olson, 6935 Central Rd., Germansville, 18053
- **LYCOMING CO BKPRS ASSN** — Bruce Frymire, 415 S. Howard St., So. Williamsport, 17701
- **MONROE CO BKPRS** — Sandy Fisher, RD 4, Box 4361, Stroudsburg, 18360
- **MONTGOMERY CO BKPR** — Harold Jenkins, 816 Kentilworth Ave., Lansdale 19446
- **NORTHWESTERN PA BKPRS** – Jeff Allio, RD 3, Nickleplate Rd., Cochranton, 16314
- **POTTER CO BEEKEEPERS ASSN** — Lloyd Tyler, Rt. 3, Coudersport, 16915
- **SCHUYKILL CO BEEKEEPERS** — Rick Freeman, RD. 2, Box 24A, Auburn, 17922
- **SUSQUEHANNA BKPRS ASSN** — Jerald Ely, RR 6, Box 6215, Montrose, 18801
- **VENANGO CO BEEKEEPERS** — Eva Montogomery, RD. 5, Box 14, Franklin, 16323
- **WAYNE CO BEEKEEPERS ASSN** — John Roethel, RD 2, Box 281, Hawley 18428
- **WESTMORELAND CO BKPRS** — RR 12, Box 292E, Greensburg, 15601
- **YORK CO BEEKEEPERS** — Judy Brenneman, RR 7, Box 7553 Spring Grove, 17362

RHODE ISLAND

- **BRISTOL CO BKPR ASSN** — Bruce Holden, 11 Field Lane, Barrington, 02806
- **KENT COUNTY** — Kent Cameron, 256 Buttonwoods Ave., Warwick 02886
- **NEWPORT COUNTY** — Ray Barker, 136 Cedar Ave., Portsmouth, 02821
- **PROVIDENCE CO BKPR ASSN** — Claire Desrosner, 275 Pine Orchard Rd., Chepachet, 02814
- **WASHINGTON COUNTY** — Ron Bachand, 33 Jeannette Court, Exeter, 02822

SOUTH CAROLINA

- **BAMBERG CO BKPRS ASSN** — Gilbert Miller, P.O. Box 299, Bamberg, 29003-0299
- **CHEROKEE CO BKPRS ASSN** — David Parker, P.O. Box 700, Gaffney, 29342
- **CHESTERFIELD CO BKPRS ASSN** — James Sweeny, P.O. Box 149, Chesterfield, 29709
- **COLLETON BKPRS ASSN** — Ron Taylor, Rt. 2, Box 669, Cottageville, 29434
- **GREENWOOD CO BKPRS ASSN** — Steve Odom, P.O. Box 246, Greenwood, 29648
- **HORRY CO BKPRS ASSN** — L. W. Rabon, 6751 Persimmon Rd., Aynor, 29511
- **LOW COUNTRY BKPRS ASSN** — Archie Piering, Rt. 1, Box 750, Cottageville, 29345
- **MID-STATE BEEKEEPING ASSN** — Ray McKenzie, 9th St, Winnsboro, 29180
- **OCONEE CO BKPRS ASSN** — Gene Rogers, Rt. 2, Box 533, Walhalla, 29691
- **PEE DEE BKPRS ASSN** — Ron Moore, Rt. 1, Box 61-B, Pamlico, 29583
- **PICKENS CO BKPRS ASSN** — Winfred Trotter, Rt. 3, Box 151, Liberty, 29657
- **PIEDMONT BKPRS ASSN** — Steve Genta, 11 Lamar Circle, Greenville, 29605
- **SPARTANBURG CO BKPRS ASSN** — Joe Guthrie, P.O. Box 1010, Spartanburg, 29304
- **SUMTER CO BKPRS ASSN** — Leverne Newman, Rt., 5, Box 490, Sumter, 29150
- **WEST PIEDMONT BKPRS** — Larry Williams, 501 Youth Center Rd., Belton, 29627
- **YORK CO BEEKEEPERS ASSN** — Charles Ford, 1511 Colony Road, Rock Hill, 29730

TENNESSEE

- **ANDERSON CO BEEKEEPERS** — Marlene Thomas, 196 Long Rd., Kingston, 37763
- **BLOUNT CO BEEKEEPERS** — John Gee, 173 Hamil Rd., Friendsville, 37737
- **CHEROKEE BKPR ASSN** — Ms. David Robinson, Rt. 4 Box 353, Decatur, 37322
- **COLUMBIA BKPRS** — Lona Vaughn, 3455 Neeley Hollow Rd, Columbia, 38401
- **DICKSON CO AREA BKPR** — Elaine Smith, Rt. 1, Box 74C, Cumberland Furnace, 37051
- **DUCK RIVER BKPRS ASSN** — Elaine Holcombe, P.O. Box 303, Shelbyville, 37160
- **FRANKLIN CO BEEKEEPERS** — James Duncun, Rt. 2, Winchester, 37398
- **LOUDON CO BEEKEEPERS** — Jim Goodman, 8633 Hwy. 11, Lenoir City, 37771
- **MEMPHIS AREA BKPR** — Rockey Starnes, 1387 Central Ave. #611, Memphis 38104
- **MONROE CO BKPRS ASSN** — James Hagermeyer, 5337 Hwy. 411, Madisonville, 37354
- **NASHVILLE AREA BKPRS** — Danny Ryan, 3029 McCanless Rd., Nolensville, 37135-9439
- **OVERTON CO BEE ASSN** — Ronald Johnson, 317 Univ. St., Livingston, 38570
- **SEVIER CO BKPR ASSN** — John R. Kelley, 613 Sandy Point Lane, Sevierville, 37862
- **STONES RIVER BKPR** — George Cooksey, 2628 Memorial Blvd., Murfreesboro, 37129-5114
- **SUMNER CO BEE ASSOC** — Wayne Vantrease, 285 Vantrease Rd., Gallatin 37066
- **WASHINGTON CO BKPR** — K. Saylor, 207 Paul Saylor Rd., Jonesboro, 37659
- **WEAKLEY CO BEE ASSN** — A. M. Walker, Dresden, 38225
- **WILSON CO BKPR ASSN** — Dorothy Bumbro, P.O. Box 125, Mt. Juliet, 37122

TEXAS

- **ALAMO AREA BKPRS ASSN** — David S. Grinnan, 168 Four Bears Tr., Kerrville 78028
- **ANGELINA ASSN** — Newton Lemke, Box 6030, Lufkin, 75901
- **BRAZOS VALLEY ASS'N** — Gordon Brynildsen, 3011 Durango, College Station, 77840
- **CAPITOL AREA BKPR** — Kim Lehman, 1106 Radam Circle, Austin, 78745-3018
- **COAST BEND BKPRS ASSN** — J. Bryant, 4526 Carroll Ln, Corpus Christi, 78405
- **COLLIN CO HOBBY BKPR** — John Whitson, 16694 FM 1778, Farmersville, 75442
- **CONCHO VALLEY ASSN** — George Engle, P.O. Box 60542, San Angelo, 76906
- **EAST TEXAS BKPR ASSN** — Richard Counts, 16239 Audrey Lane, Arp, 75750
- **EL PASO ASSN** — O.T. Franklin, 10220 Bermuda, El Paso, 79925
- **FORT BEND ASSN** — Elton Reynolds, 3419 Kosterhoff Rd., Rosenberg, 77471
- **GALVESTON CO ASSN** — Margie Coplin, 3512 Jack Beaver Rd., Santa Fe, 77517
- **GOLD TRI ASSN** — Wallace Commander, 2445 Green Ave., Port Arthur, 77642
- **HARRIS CO ASSN** — Herb Barrier, 12318 Thornbriar, Pearland, 77581-2022
- **HEART OF TX BEEKEEPERS** — Ann G. Hill, 303 W. Chantilly, Waco, 76706
- **HOUSTON BKPRS ASSN** — Herschel D. Womac, 11215 Tyne Court, Houston, 77024
- **JOHNSON CO BKPRS ASSN** — Ray Stephens, 3800 N. Cummings Dr., Alvarado, 76009
- **MONTGOMERY CO BKPRS** — James Williams, 418 Oak Hill, Conroe, 77304
- **N. HARRIS CO BKPRS ASSN** — J Johnson, 2403 Fawnwood, Spring, 77386-2419
- **PERMIAN BASIN ASSN** — Dean Brittingham, 2312 North Adams, Odessa, 79761
- **RED RIVER VALLEY ASSN** — Larry Graverholz, P. O. 2501, Wichita Falls, 76307
- **RIO GRANDE VALLEY ASSN** — Billy Wright, RT. 5, Box 77, Donna, 78537
- **SOUTH PLAINS BEEKEEPERS** — James Colson, P.O. Box 2247, Lubbock, 79408
- **TRINITY VALLEY ASSN** — Mr. Hutchinson, 1802 St. Francis Ave., Dallas, 75228
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- **CENTRAL CARIBOO BKPRS ASSN** — Emile Bouchard, RR 4 Site 11 Comp 11, Williams Lake, BC V2G 4M8
- **CENTRAL ONT. BKPRS ASSN**—Christine Bashford, RR 1, Reaboro, Ont. K0L 2X0
- **CHILLIWACK BKPRS ASSN** — M. Gouwenbert, 5839 Kamp Rd., RR 2, Agassiz, BC V0M 1A0
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- **GOLDEN HORSHOE BK ASSN** — Vince Mevison, RR 1, Branchton, ONT N0B 1L0
- **GRAND RIVER BK ASSN** — Vince Nevidon, RR 1, Branchton, Ont. N0B 1L0
- **HONEY PRODUCERS ASSN** — Lorne Baird, Site 128, Comp 28 RR 1, Port Alberni, BC V9Z 7L5
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- **LA FED DES API DU QUEBEC** — Helene Prince, 555 Boul Roland Therrien, Longuevil, QUE J4H 3Y9
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- **MAPLE RIDGE DIV OF BCHPA** — Louise Sawyer, 21758 128TH ST RR 2, Maple Ridge, BC V2X 7E7
- **MARITIME BKPRS ASSN B**—Linda Donovan, 191 Salisbury Rd., Moncto E1E 1A6 BC
- **MDSX/OXFD/ELG BKPRS ASSN** — Glen Mcleon, RR 2, 776 Cromarty Dr., Dorchester, Ont. N0L 1G5
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- **NO FRASER BKPRS ASSN** — Richard Wakely, 11453 284th St. RR %, Ruskin, BC V2X 8Y6
- **N OKANAGAN DIV BCHPA** — Patrick Connell, Box 524, Vernon, BC V1T 6M4
- **ORILLA & DIST BKPRS ASSN**—Bill Kinghorn, RR 1, Severn Bridge, P0E 1N0, Ont.
- **PEACH RIVER SO BKPRS**— Gordon Parslow, Box 873, Dawson Creek, BC V1G 4H8
- **P E ISLAND BEE CO-OP ASSN**—J. Burhoe, P.O. Box 1114, Charlottetown C1A 7M8
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- **QUESNEL BKPRS. ASSN.**—Bud Carson, RR 3 West Creek, Quesnel, BC V2J 3H7
- **QUINTE BEEKEEPERS ASSN** — Danny Clarke, RR 4, Stirling K0K 3E0, Ont.
- **RANY RIVER BKPRS ASSN** — Richard Nelson, RR 1, Stratton, P0W 1N0 ONT.
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- **SHUSWAP BKPRS. ASSN.** — Phil Michaelis, 2250 Lakeshore Rd., Salmon Arm, V1E 3X9
- **SMITHERS BKPRS CLUB** — Bob Blackburn, RR 1 Slack Rd., Smithers, BC V0J 2N0
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- **SO. OKANAGAN DIV OF BCHPA** — Sue Harvey, Box 375, Osoyoos, BC V0H 1V0
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- **WELLINGTON CO BK ASSN**—Jim & Cecelia Smith, RR 4, Fergus, Ontario N1M 2W5
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He was born in Coleraine, MA, February 24, 1815, and died December 9, 1881.

It affords me a melancholy satisfaction to review my long acquaintance with the late William W. Cary, and to set out more fully than has yet been attempted, some of the important services which he rendered to beekeeping. To do this seems to me the more obligatory, as he so seldom used his pen for the press that these services might fail to be put on record.

After testing quite largely my movable-comb frames in West Philadelphia, in the bee season of 1852, in the Fall of that year I went to Greenfield, MA to introduce my hive where I was best-known as a beekeeper. Mr. Cary kept some bees in the adjoining town of Coleraine, and was among the first to take an interest in my invention. He was very fond of bees, and more than usually familiar with their habits – and as soon as he saw the working of the hive, he believed that it would make a revolution in beekeeping. For the six years that I remained in Greenfield, we were in such frequent communication that, in furthering my experiments, his apiary was almost as much at my service as my own.

In the Spring of 1860, I was invited by Mr. S.B. Parsons, of Flushing, L.I., to advise him how best to breed and disseminate the Italian (*Ligurian*) bees which he had recently imported. Finding that the person who came in charge of most of these bees could not do the work that was expected of him, I advised Mr. Parsons to secure the services of Mr. Cary. To great energy of character and good business habits, he united long experience in the management of movable-frame hives with an enthusiastic desire to see the introduction of these foreign bees made a success. From my intimate acquaintance with him I could further assure Mr. Parsons that, with all these requisites for the position, he possessed in as large a degree as anyone I had ever known, that "highest fidelity" which Columella, nearly 2,000 years ago, declared to be an essential qualification for the superintendance of an apiary – and which he thought was very rarely to be met with. Is it much easier to find that now than it was then?

No better proof could possibly be given of the extent and thoroughness of his work than the fact that 113 queens bred by him that season were so carefully prepared for shipment, under the joint supervision of himself and Mr. A.G. Biglow, that all except two of them were safely carried by Mr. Biglow from New York to San Francisco. Mr. B. had stopped over one steamer on the Isthmus of Panama to give his bees a cleansing flight, and one queen entering the nucleus of another, both were killed. The colonies to which they belonged, when examined on their arrival at California, were each found to have reared another queen.

After his splendid achievements in Mr. Parsons' service, Mr. Cary greatly enlarged his own apiary, and placed himself in the front rank of reliable breeders of Italian queens.

When Dr. E. Parmly of NY imported a number of Egyptian queens, he entrusted them to Mr. Cary, having, as I know, as strong confidence as myself in his sagacity and fidelity. Mr. Cary first called my attention, in his own apiary, to the inferior appearance of the comb honey of those bees. It was capped in such a way as to look like honey damaged by "sweating" – so called after being kept in too damp a place. He was also the first to notice that Egyptian bees, in extending their combs, built their lower edges almost perfectly square throughout their whole length – in marked contrast to the way in which black bees build them – and improving in this respect even upon the Italians. Although I imported the first Egyptian queen, Mr. Cary had the largest experience with this variety, and after a fair trial we both discarded them as very much inferior to the Italians.

When near him, I always took peculiar pleasure in communicating to him all matters that from time to time were engaging my attention, and our occasional meetings in later years were highly prized. He seldom failed to detect any flaw in what was submitted to his judgment, and his deliberate "yes" or "no" had greater weight with me in bee matters than that of almost any other person.

Mr. Cary's location was inferior in honey resources to those who in this country have achieved the greatest pecuniary success from the keeping of bees; he was also quite lame, from an accident in his youth; yet notwithstanding these and other obstacles, he built up gradually a large apiary. He was not only a strictly honest man, but a highly honorable one in all his dealings; and in cases of doubt, he made it his rule to give his customers the benefit of that doubt, instead of claiming it for himself. Like myself, he had the help of an only son in the management of his business; but, happier in this respect than myself, he was not called to lament his premature death.

Mr. Cary's interest in bees ceased only with his life. A few weeks before his death he was able to be out in his apiary, where he witnessed with much pleasure some novel arrangements for the safe wintering of a colony in the open air.

Samuel Wagner, Moses Quinby, Richard Colvin, Adam Grimm, Roswell C. Otis, William W. Cary – they have all passed away! And probably no one knows better or appreciates more highly than their old friend, who still survives to honor their memories, how much their various labors contributed to the splendid success of the movable-frame principle in American beekeeping.

L.L. Langstroth, Oxford, O., Nov. 10, 1885.

William Cary

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